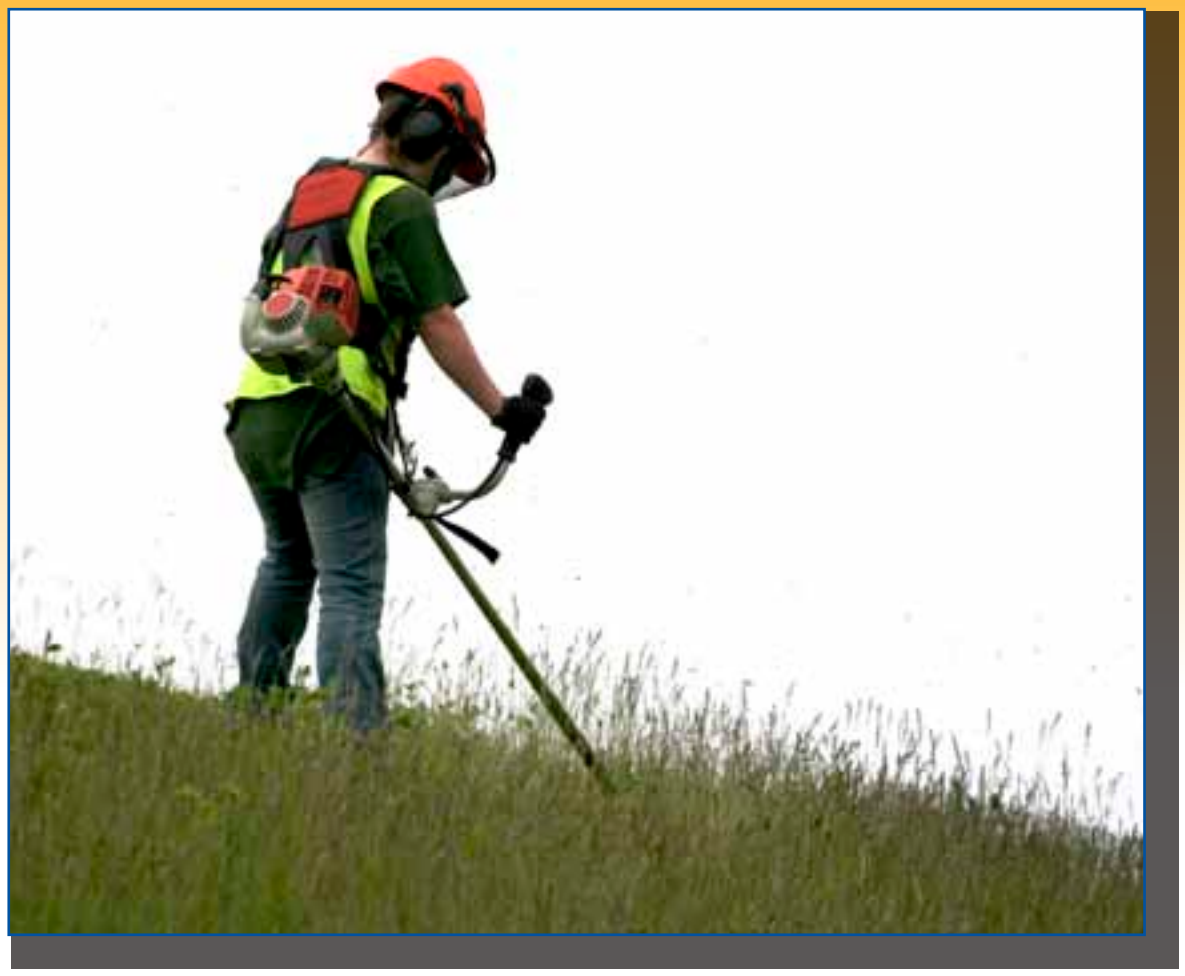
Commonwealth of Massachusetts
Department of Labor Standards
Massachusetts On-Site Consultation Program

Safety and Health Programs for Landscape and Horticultural Services



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The Commonwealth of Massachusetts
Department of Labor Standards
On-Site Consultation Program

www.mass.gov/dols/consult

Safety and Health Programs for Landscape and Horticultural Services

Presented by The Massachusetts Department of Labor Standards On-Site Consultation Program

Introduction

Industry Group 078 - Landscape and Horticultural Services

Industry Description: This SIC category encompasses a wide range of services. Included in this category are establishments engaged in landscape architecture garden planning, lawn mowing and fertilizing, sod laying, garden planting, arborist services, line-clearance tree trimming, and ornamental tree planting, just to name a few.

Top 10 Violations Cited

Standard	# Cited	# Inspections	Description
1910.132	51	42	Personal Protective Equipment
1910.1200	49	23	Hazard Communication
5(a)(1)	43	38	General Duty Clause
1910.67	31	27	Vehicle-Mounted Elevating/Rotating Work Platforms
1910.133	24	24	Eye & Face Protection
1910.269	22	12	Electric Power Generation/Transmission/Distribution
1910.135	17	17	Occupational Head Protection
1910.266	17	6	Pulpwood Logging
1910.305	16	7	Electrical, Wiring Methods, Components
1904.39	10	10	Fatality/Multiple Hospitalization Accident Reporting

Source: IMIS Database – FY 2005 (Federal Only)

Some Potential Hazards and Their Sources

Hazard	Source
Sprains and strains	Manual handling of landscaping tools and materials
Electrical hazards	Working in proximity to overhead power lines,
Noise	Powered equipment such as chain saws, chippers, and trenchers
Heat stress	Working for extended periods of time outdoors
Falls	Working from bucket trucks, working in trees
Struck-by	Working around motor vehicles, overhead hazards

Hazard Communication Standard
29 CFR 1910.1200

Under the provisions of the Hazard Communication Standard, employers are responsible for informing employees of the hazards and the identities of workplace chemicals to which they are exposed. The Occupational Safety and Health Administration (OSHA) issued the Hazard Communication Standard. The basic goal of the standard is to be sure employers and employees know about work hazards and how to protect themselves; this should help to reduce the incidence of chemical source illness and injuries.

About 32 million workers work with and are potentially exposed to one or more chemical hazards. There are an estimated 650,000 existing chemical products, and hundreds of new ones being introduced annually. This poses a serious problem for exposed workers and their employers.

Chemical exposure may cause or contribute to many serious health effects such as heart ailments, central nervous system, kidney and lung damage, sterility, cancer, burns, and rashes. Some chemicals may also be safety hazards and have the potential to cause fires and explosions and other serious accidents.

In addition to the Hazard Communication Standard materials used by landscapers, professional pest management specialists and arborists are also covered under the Federal Insecticide Fungicide and Rodenticide ACT (FIFRA) public Law 92-516. FIFRA is administered by the Federal EPA, through the Massachusetts Department of Food and Agriculture, Pesticide Board under the Code of Massachusetts Regulations 333. When chemicals are required to be labeled under FIFRA they are exempt from the labeling requirements of the OSHA Hazard Communication standard.

Sample Hazard Communication Program for Landscapers
(29 CFR 1910.1200)

General Information

In order to comply with OSHA 1910.1200, Hazard Communication Standard, the following written Hazard Communication Program has been established for ___(Company Name)___. The written program will be available at ___(Location)___ for review by any interested employee.

Container Labeling

___(Responsible Person)___ shall verify that all in-coming containers received for use are clearly labeled to indicate:

- The identity of the contents (The identity must match the corresponding MSDS);
- Appropriate hazard warnings (Including routes of entry and target organs);
- The name and address of the manufacturer, importer, or responsible party;
- The supervisor of each area will ensure that all secondary containers (those containers other than the original) will be labeled with:
    - The identity of the contents (The identity must match the corresponding MSDS);
    - Appropriate hazard warning (including routes of entry and target organs).

Material Safety Data Sheets (MSDS)

___(Person/Position)___ will be responsible for obtaining and maintaining material safety data sheets for the company.

It is the policy for this company that when toxic or hazardous substances are received without an MSDS or the appropriate MSDS is not on file at __(Company Name)___ that the chemical will not be accepted until such information is available.

___(Person/Position)___ will review incoming data sheets for new and significant health/safety information. ___(He/She)___will see that any new information is passed on to the affected employees. If a MSDS is incomplete, a new MSDS will be requested from the manufacturer/supplier by ___(Person/Position)___. MSDSs are available to each employee during his/her work shift. To obtain a copy of the MSDS __(Explain how employees can obtain MSDSs)__.

Employee Training and Information

___(Person/Position)___ is responsible for the employee training program. ___(Person/Position)___will ensure that all elements specified below are carried out. Prior to starting work each new employee of ___(Company Name___ will attend a health and safety orientation and will receive information and training on the following:

- an overview of the requirements contained in the OSHA Hazard Communication Standard, 1910.1200
- any operations in their work area where hazardous chemicals are present
- location and availability of our written hazard program
- physical and health hazards of the chemicals in their work area
- methods and observation techniques used to determine the presence or release of toxic and hazardous substances in the work area
- measures employees can take to protect themselves from hazards in their workplace, including specific procedures the employer has implemented to prevent exposure to hazardous chemicals such as appropriate work practices, emergency procedures, and personal protective equipment
- explanation of the labeling system and what the label information means
- explanation of MSDSs and how employees can use this information to protect themselves

After attending the training class, each employee will be given a quiz to verify that they attended and understand the training, received our written materials, and understand this company's policies on Hazard Communication. *(This is an optional item which we recommend for the employer to use to track the employee training and to ensure that employees have understood the material.)*

Prior to a new chemical hazard being introduced into any section of this company, each employee of that section will be given information as outlined above.

List of Hazardous Chemicals

The following is a list of all known toxic and hazardous substances used at ___(Company Name___. Further information on each noted substance can be obtained by reviewing the appropriate Material Safety Data Sheets.

Toxic/Hazardous Material

Identity of Chemical	Substances	Work Area and Process

Hazardous Non-Routine Tasks

Periodically, employees are required to perform hazardous non-routine tasks. Prior to starting work on such projects, each affected employee will be given information by their supervisor about hazardous chemicals to which they may be exposed during such activity.

This information will include:

- specific hazards
- protective/safety measures the employee can take
- measures the company has taken to lessen the hazards including ventilation, respirators, presence of another employee, and emergency procedures

Non-routine tasks performed by the employees of this company are:

Task	Toxic and Hazardous Substances

If employees do not understand any aspect of the above information, they should not perform the task. The supervisor should be contacted for additional training.

Hazardous Substances in Unlabeled Pipes (if applicable)

To ensure that our employees who work on unlabeled pipes have been informed as to the hazardous substances contained within, the following policy has been established. Prior to starting work on unlabeled pipes our employees are to contact their supervisor for the following information:

- The hazardous substance in the pipe
- Potential hazards
- Safety precautions which shall be taken

Informing Contractors

It is the responsibility of ____(Person/Position)____ to provide contractors the following information:

- Notify contractors of the toxic and hazardous substances to which they may be exposed while on the job site and how the appropriate MSDS can be obtained;
- Precautionary measures that need to be taken to protect contracted employees during the workplace's normal operating conditions and in foreseeable emergencies;
- Explanation of labeling systems used by _____Company Name)_____.

____(Person/Position)____ will be responsible for contacting each contractor before work is started in the company to gather and disseminate any information concerning chemical hazards that the contractor is bringing to our workplace.

If anyone has questions or does not understand this plan, contact ____(Person/Position)____.
_____(Company Name)_____ hazard communication program will be monitored by ____(Person/Position)____ to ensure that the policies are carried out and the plan is effective.

_____

Signature of company president/owner

_____

Date

Personal Protective Equipment (PPE)

Personal protective equipment (PPE) should not be used as a substitute for engineering, work practice, and/or administrative controls. Personal protective equipment should be used in Conjunction with these controls to provide for employee safety and health in the workplace and is required by the Occupational Safety and Health Administration(OSHA) to be worn when needed. Personal protective equipment includes all clothing and other work accessories designated to create a barrier against workplace hazards. The basic element of any management program for personal protective equipment should be an in depth evaluation of the equipment needed to protect against the hazards at the workplace. Management dedicated to the safety and health of the employees should use that evaluation to set a standard operating procedure for personnel, then train employees on the protective limitations of personal protective equipment, and on its proper use and maintenance.

Using personal protective equipment requires hazard awareness and training on the part of the user. Employees must be aware that the equipment does not eliminate the hazard. If the equipment fails, exposure will occur. To reduce the possibility of failure, equipment must be properly fitted and maintained in a clean and serviceable condition.

Selection of the proper personal protective equipment for a job is important. Employers and employees must understand the equipment's purpose and limitations. The equipment must not be altered or removed even though an employee may find it uncomfortable. (Sometimes equipment may be uncomfortable simply because it doesn't fit properly)

Personal Protective Equipment
Written Certification of Workplace Hazard Assessment
(29 CFR 1910.132)

Written Certification of Workplace Hazard Assessment

This is to certify that ___(name)___ has evaluated ___(Work Area or Operation evaluated)___ on ___(date)___ in order to determine if PPE is required and, if so, what specific type is required.*

For example: The following PPE is required for this operation or work area:

PPE Required	Specific Type	Hazard
Eye/Face Protection	Impact Resistant Goggles	Flying Wood Chips
Head Protection	Class A Helmet	Impact/low voltage conductors
Foot Protection	Safety Shoes with impact protection	Dropped objects
Hand Protection	Polyvinyl alcohol gloves(PVA)	Chemicals
Respirator	Half-face respirator with appropriate cartridges as indicated on the MSDS	Pesticides

*Statements equivalent to those in **bold** letters are required by the PPE Standard.

Personal Protective Equipment
Written Certification of Training
(29 CFR 1910.132)

Certifications of Training in the Use of PPE*

The following employees have been trained by (name of Individual) on the following subjects:

i) When PPE is required

ii) What PPE is required

iii) How to properly don, doff, adjust, and wear the required PPE

iv) Limitations of the required PPE

v) The proper care, maintenance, useful life and disposal of the required PPE

All employees trained have demonstrated an understanding of this information.

Work Area/Operation	**Employee Trained***	**Date of Training***

* Statements equivalent to those given in **bold** letters are <u>required</u> by the PPE Standard.

Personal Protective Equipment

Personal protective equipment (PPE), for the head, ears, eyes, face, hands, and legs are designed to prevent or lessen the severity of injuries to loggers.

Highlights of PPE Requirements

- ☐ PPE must be inspected prior to use on each work shift to ensure it is in serviceable condition (1910.266(d)(1)(i-ii))
- ☐ The following PPE must be used when hazards make it necessary (1910.266(d)(1)(iii-vii)); Except for foot protection, all PPE must be provided by the employer at no cost to the employee
  - ☐ Head Protection
  - ☐ Hearing Protection
  - ☐ Eye/Face Protection
  - ☐ Leg Protection
  - ☐ Foot Protection
  - ☐ Hand Protection

You need protection from head to toe.

The figure to the right maps the chain saw injuries to the body in one year. It demonstrates the need to protect the whole body.

Accident Location and Frequency Related to Chain Saw Use in 1999

Head area - 2,686

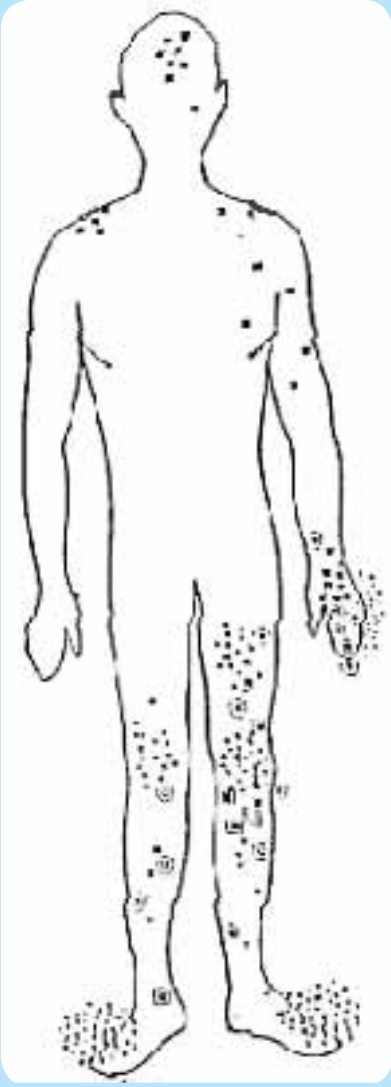
Upper body - 2,452

Hand area 10,200

Upper leg, knee, lower leg - 10,310

Foot area - 1,872

Total - 28,643



Statistics supplied by the U.S. Consumer Product Safety Commission report on Chain Saw-Related Accidents in 1999
Source: NEISS (National Electronic Injury Surveillance System)

Head Protection
Hard hats must be worn when overhead hazards are present. The hard hats must comply with ANSI standards. Check for an ANSI label inside the hat.

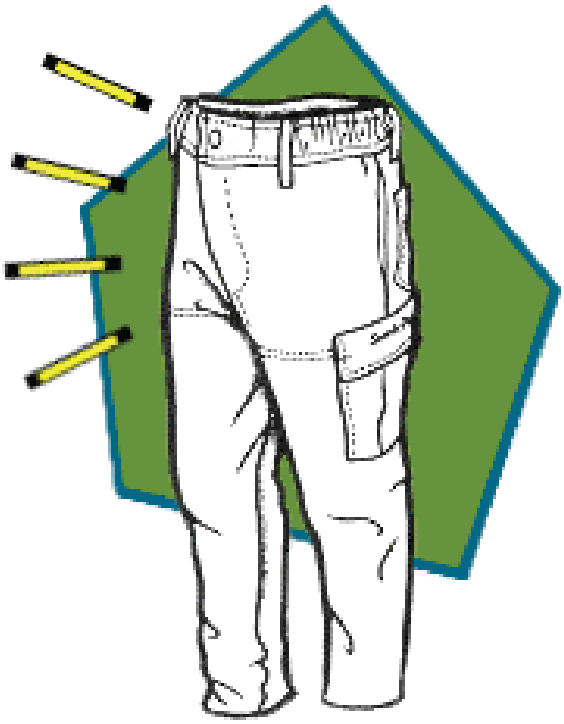
Hearing Protection
Requirements for hearing protection are found in 1910.95. Particular attention should be paid to monitoring the logging operation to determine the noise levels employees are exposed to. This will determine whether the employer is required to implement a hearing conservation program. Some basic elements of a hearing conservation plan are providing audiograms, training employees, and providing hearing protection in a variety of forms at no cost to the employee.

Eye/Face Protection
Eye and face protection must be worn where there is potential for injury to the eyes or face.

Leg Protection
Each employee who operates a chain saw must wear leg protection constructed with cut-resistant material. The leg protection must extend from the upper thigh down to the boot top and adequately cover the leg.

Leg protection is available in a variety of forms, including chaps,logger pants, and leggings. The protective material also comes in a variety of forms including ballistic nylon, polyester, Kevlar, Engtek, etc.

Underwriters Laboratories (UL) currently tests and labels leg protection which meets minimum cut resistance requirements.



Foot Protection
Employers must assure that each employee wear heavy duty logging boots that are waterproof or water repellent, and cover and provide support to the ankle. If the employee uses a chain saw, the footwear must be constructed with cut-resistant materia that will protect against contact with a running chain saw. Calk soled boots are acceptable when they are required for the employee's job. [1910.266(d)(1)(v)]

Underwriters Laboratories (UL) currently tests and labels foot protection which meets minimum cut resistance requirements. (Reference ASTM F1818)

Hand Protection
Employees who handle wire rope are required to wear hand protection that protects against puncture wounds, cuts, and lacerations. [1910.266(d)(1)(iii)]

Sample Written Respirator Program
29 CFR 1910.134

The following model written respirator program is provided as a guideline only. Employers should develop written programs specific to their company needs.

General Information

In order to comply with OSHA Standard 29 CFR 1910.134, Respirator Standard, The following written respirator program has been established for ___company name___. The written program will be available at ___location___ for review by any interested employee.

Purpose

___Company name___ has determined that employees in the ___Department Names___ are exposed to respiratory hazards during routine operations. These hazards include___Indicate respiratory hazard___. **For example: wood dusts, solvents, metals etc.,** and in some cases represent Immediately Dangerous to Life or Health (IDLH) conditions. The purpose of this program is to ensure that all employees are protected from exposure to these respiratory hazards. The work processes requiring respirator use at ____Company name___ are outlined below in the Scope and Application section of this program.

Scope and Application

This program applies to all employees who are ***required*** to wear respirators during normal work operations, and during some non-routine or emergency operations. The requirements for voluntary respirator use are explained in that section of this document. Employees participating in the respiratory protection program do so at no cost to them. The expense associated with training, medical evaluations and respiratory protection equipment will be paid by the company.

Respirator Use at Company Name

List type of respirators used and the department or process where these respirators are used.

Respirator Type	Department/Process

Responsibilities

Program Administrator
The Program Administrator is responsible for administering the respiratory protection program.

Duties of the program administrator include:

- Identifying work areas, processes or tasks that require workers to wear respirators
- Selection of respiratory protection options
- Monitoring respirator use to ensure that respirators are used in accordance with their certifications
- Arranging for and/or conducting training
- Ensuring proper storage and maintenance of respiratory protection equipment
- Conducting qualitative fit testing
- Administering the medical surveillance program
- Maintaining records required by the program
- Evaluating the program
- Updating written program, as needed

The Program Administrator for Company Name is Name of Program Administrator.

Supervisors

Supervisors are responsible for ensuring that the respiratory protection program is implemented in their particular areas. In addition to being knowledgeable about the program requirements for their own protection, supervisors must also ensure that the program is understood and followed by the employees under their charge. Duties of the supervisor include:

- Ensuring that employees under their supervision (including new hires) have received appropriate training, fit testing, and annual medical evaluation;
- Ensuring the availability of appropriate respirators and accessories
- Being aware of tasks requiring the use of respiratory protection
- Enforcing the proper use of respiratory protection when necessary
- Ensuring that respirators are properly cleaned, maintained, and stored according to the respiratory protection plan
- Ensuring that respirators fit well and do not cause discomfort
- Continually monitoring work areas and operations to identify respiratory hazards
- Coordinating with the Program Administrator on how to address respiratory hazards or other concerns regarding the program

Supervisors receive respiratory training ____Indicate time and location of training____.

Training is provided by___Indicate who does the training___.

The following are supervisors of ___Company name____:

List names of supervisors

Employees

Each employee has the responsibility to wear his or her respirator when and where required and in the manner in which they were trained. Employees must also:

- Care for and maintain their respirators as instructed, and store them in a clean sanitary location
- Inform their supervisor if the respirator no longer fits well, and request a new one that fits properly
- Inform their supervisor or the Program Administrator of any respiratory hazards that they feel are not adequately addressed in the workplace and of any other concerns that they have regarding the program

Respirator Selection

The Program Administrator will select respirators to be used on site, based on the hazards to which workers are exposed and in accordance with all OSHA standards. The Program Administrator will conduct a hazard evaluation for each operation, process, or work area where airborne contaminants may be present in routine operations or during an emergency. The hazard evaluation will include:

1. Identification and development of a list of hazardous substances used in the workplace by department, or work process.

2. Review of work processes to determine where potential exposures to these hazardous substances may occur. This review shall be conducted by surveying the workplace, reviewing process records, and talking with employees and supervisors.

3. Exposure monitoring to quantify potential hazardous exposures. Monitoring will be conducted by Indicate who will be doing the air monitoring .

The results of the current hazard evaluation are the following:

(Company Name) Hazard Assessment Date Assessment Performed

Process	Contaminant	Exposure Level	Exposure Limit Controls

The Program Administrator will update the hazard assessment as needed (change in work process, new procedure). If an employee feels that respiratory protection is needed during a particular process she/he should contact their supervisor or the program administrator. The Program Administrator will evaluate the process. The Program Administrator will communicate the results of the assessment back to the employees.

Medical Evaluation

Employees are not permitted to wear respirators until a physician or other licensed healthcare profession (PLHCP) has determined that they are medically able to do so. Any employee refusing the medical evaluation will not be allowed to work in an area requiring respirator use. A physician or other licensed healthcare professional at Name of clinic conducting medical evaluations will provide the medical evaluations. Medical evaluation procedures are as follows:

- The medical evaluation will be conducted using the questionnaire provided in Appendix C of the respiratory protection standard. The Program Administrator will provide a copy of this questionnaire to all employees requiring medical evaluations
- To the extent feasible, the company will assist employees who are unable to read the questionnaire (by providing help in reading the questionnaire). When this is not possible, the employee will be sent directly to the physician/PLHCP for medical evaluation
- The confidentiality of the employees being evaluated must be protected. This can be done, for example, by supplying affected employees a copy of the medical questionnaire to fill out along with a stamped pre-addressed envelope for mailing to the company physician/PLHCP. Employees will be permitted to fill out the questionnaire on company time
- Follow-up medical exams will be granted to employees as required by the standard, and/or as deemed necessary by the physician/PLHCP
- All employees will be granted the opportunity to speak with the physician/PLHCP about their medical evaluation, if they so request

The Program Administrator will provide the physician/PLHCP with a copy of this program, a copy of the Respiratory Protection standard, the list of hazardous substances by work area, and for each employee requiring evaluation:

1. his or her work area or job title
2. proposed respirator type and weight
3. length of time required to wear respirator
4. expected physical work load (light, moderate, or heavy)
5. potential temperature and humidity extremes
6. and any additional protective clothing required

Any employee required for medical reasons to wear a positive pressure air purifying respirator will be provided with a powered air purifying respirator.

After an employee has received clearance and begun to wear his or her respirator, additional medical evaluations will be provided under the following circumstances:

1. Employee reports signs and/or symptoms related to their ability to use a respirator, such as shortness of breath, dizziness, chest pains, or wheezing
2. The physician/PLHCP or supervisor informs the Program Administrator that the employee needs to be reevaluated
3. Information from this program, including observations made during fit testing and program evaluation, indicates a need for reevaluation
4. A change occurs in workplace conditions that may result in an increased physiological burden on the employee

All examinations and questionnaires are to remain confidential between the employee and the physician/PLHCP.

(Name of Company) Employees are currently enrolled in the Respiratory Protection Program:

List employees enrolled in the respiratory protection program:

Fit Testing

Employees who are required to wear respirators will be fit-tested:

- Prior to being allowed to wear any respirator with a tight fitting facepiece
- Annually
- When there are changes in the employee's physical condition that could affect respiratory fit (e.g., obvious change in body weight, facial scarring, etc.)

Employees will be fit tested with the make, model, and size of respirator that they will actually wear. Employees will be provided with several models and sizes of respirators so that they may find an optimal fit. Fit testing of PAPRs is to be conducted in the negative pressure mode. The Program Administrator will conduct fit tests using Indicate type of fit-testing procedure to be used.

Respirator Use

General Use Procedures:
Employees will use their respirators under conditions specified by this program, and in accordance with the training they receive on the use of each particular model. In addition, the respirator shall not be used in a manner for which it is not certified by NIOSH or by its manufacturer.

All employees shall conduct user seal checks each time that they wear their respirator. Employees shall use either the positive or negative pressure check (depending on which test works best for them) specified in Appendix B-1 of the Respiratory Protection Standard. Employees will receive seal check training Specify when and by whom.

All employees shall be permitted to leave the work area to maintain their respirator for the following reasons:

1. to clean their respirator if the respirator is impeding their ability to work
2. change filters or cartridges
3. replace parts
4. or to inspect respirator if it stops functioning as intended

Employees should notify their supervisor before leaving the area.

Employees are not permitted to wear tight-fitting respirators if they have any condition, such as facial scars, facial hair, or missing dentures, that prevents them from achieving a good seal. Employees are not permitted to wear headphones, jewelry, or other articles that may interfere with the facepiece-to-face seal.

Emergency Procedures:
The following work areas have been identified as having foreseeable emergencies:

List work area and potential hazard. *For example: Spill of large quantities of pesticides.*

Emergency Procedures are as follows:

Give an explanation of the procedures at your company. *The Emergency Action Plan describes these procedures (including proper evacuation routes and rally points) in greater detail.*

Emergency escape respirators are located: *If applicable list were emergency escape respirators are located.*

If applicable-Respiratory protection in these instances is for escape purposes only. Employees are not trained as emergency responders, and are not authorized to act in such a manner.

Respirator Malfunction

1. APR (Air-purifying respirator)Respirator Malfunction:

For any malfunction of an APR (e.g., such as breakthrough, facepiece leakage, or improperly working valve), the respirator wearer should inform his or her supervisor that the respirator no longer functions as intended, and go to the designated safe area to maintain the respirator. The supervisor must ensure that the employee receives the needed parts to repair the respirator, or is provided with a new respirator.

2. Atmosphere-supplying Respirator Malfunction:

All workers wearing atmosphere-supplying respirators will work with a buddy. Buddies shall assist workers who experience an SAR (Supplied-air respirator) malfunction as follows:

Indicate how employees will assist each other. *For example: If a worker in the spray booth experiences a malfunction of an SAR, he or she should signal to the buddy that he or she has had a respirator malfunction. The buddy shall don an emergency escape respirator and aid the worker in immediately exiting the spray booth.*

Immediately Dangerous to Life and Health (IDLH) Procedures

The Program Administrator has identified the following area as presenting the potential for IDLH conditions: *If applicable indicate where IDLH atmospheres and special precautions that must be taken.*

Air Quality

For supplied-air respirators, only Grade D breathing air shall be used in the cylinders. The Program Administrator will coordinate deliveries of compressed air with the company's vendor, Indicate name of compressed air supplier, and require Compressed air supplier name to certify that the air in the cylinders meets the specifications of Grade D breathing air. Attached to this written program is the Grade D Certification from the supplier.

The air supplier should provide you with a Grade D Air Certification which can be copied and attached as an Appendix.

The Program Administrator will maintain a minimum air supply of one fully charged replacement cylinder for each SAR unit. In addition, cylinders may be recharged as necessary from the Name of supplier, and deliveries of new air are coordinated by the Program Administrator.

Cleaning, Maintenance, Change Schedules and Storage

Cleaning

Respirators are to be regularly cleaned and disinfected at the designated respirator cleaning station located Indicate location. The company will supply cleaning supplies and allow an adequate amount of time to perform respirator cleaning and disinfection. Respirators issued for the exclusive use of an employee shall be cleaned as often as necessary to maintain them in a sanitary and properly functioning condition.

Atmosphere supplying and emergency use respirators are to be cleaned and disinfected after each use.

The following procedure is to be used when cleaning and disinfecting respirators:

- Disassemble respirator, removing any filters, canisters, or cartridges
- Wash the facepiece and associated parts in a mild detergent with warm water. Do not use organic solvents
- Rinse completely in clean warm water
- Wipe the respirator with disinfectant wipes (70% Isopropyl Alcohol) to kill germs
- Air dry in a clean area
- Reassemble the respirator and replace any defective parts
- Place in a clean, dry plastic bag or other air tight container

Note: The Program Administrator will ensure an adequate supply of appropriate cleaning and disinfection material at the cleaning station. If supplies are low, employees should contact their supervisor, who will inform the Program Administrator.

Maintenance

Respirators are to be properly maintained at all times in order to ensure that they function properly and adequately protect the employee. Maintenance involves a thorough visual inspection for cleanliness and defects. Worn or deteriorated parts will be replaced prior to use. No components will be replaced or repairs made beyond those recommended by the manufacturer.

Repairs to regulators or alarms of atmosphere-supplying respirators will be conducted by the manufacturer. Arrangements for repairs will be made by the Program Administrator.

The following checklist will be used when inspecting respirators:

< Facepiece:
- cracks, tears, or holes
- facemask distortion
- cracked or loose lenses/faceshield

< Headstraps:
- breaks or tears
- broken buckles

< Valves:
- residue or dirt
- cracks or tears in valve material

< Filters/Cartridges:
- approval designation
- gaskets
- cracks or dents in housing
- proper cartridge for hazard

< Air Supply Systems:
- breathing air quality/grade
- condition of supply hoses
- hose connections
- settings on regulators and valves

Employees are permitted to leave their work area to perform limited maintenance on their respirator in a designated area that is free of respiratory hazards. Situations when this is permitted include to wash their face and respirator facepiece to prevent any eye or skin irritation, to replace the filter, cartridge or canister, and if they detect vapor or gas breakthrough or leakage in the facepiece or if they detect any other damage to the respirator or its components.

Change Schedules

Based on discussions with our respirator supplier, employees wearing respirators with cartridges shall change the cartridges on their respirators ___Indicate when cartridges should be changed___ to ensure the continued effectiveness of the respirators.

Storage

Respirators must be stored in a clean, dry area, and in accordance with the manufacturer's recommendations. Each employee will clean and inspect their own air-purifying respirator in accordance with the provisions of this program and will store their respirator in a plastic bag in __Indicate location of respirator storage___. Each employee will have his/her name on the bag and that bag will only be used to store that employee's respirator.

Atmosphere supplying respirators will be stored in the storage cabinet outside the work area ___Indicate where atmosphere supplying respirators should be stored_____.

Defective Respirators

Respirators that are defective or have defective parts shall be taken out of service immediately. If during an inspection, an employee discovers a defect in a respirator, he/she is to bring the defect to the attention of his or her supervisor. Supervisors will give all defective respirators to the Program Administrator. The Program Administrator will decide whether to:

- Temporarily take the respirator out of service until it can be repaired
- Perform a simple fix on the spot such as replacing a headstrap
- Dispose of the respirator due to an irreparable problem or defect

When a respirator is taken out of service for an extended period of time, the respirator will be tagged out of service, and the employee will be given a replacement of similar make, model, and size. All tagged out respirators will be kept ___Indicate location___.

Training

The Program Administrator will provide training to respirator users and their supervisors on the contents of the ___Company name___ Respiratory Protection Program and their responsibilities under it, and on the OSHA Respiratory Protection standard. Workers will be trained *prior to* using a respirator in the workplace. Supervisors will also be trained prior to using a respirator in the workplace or prior to supervising employees that must wear respirators.

The training course will cover the following topics:

- the Company name Respiratory Protection Program
- the OSHA Respiratory Protection standard
- respiratory hazards encountered at Company name and their health effects
- proper selection and use of respirators
- limitations of respirators
- respirator donning and user seal (fit) checks
- fit testing
- emergency use procedures
- maintenance and storage
- medical signs and symptoms limiting the effective use of respirators

Employees will be retrained annually or as needed (e.g., if they change departments and need to use a different respirator). Employees must demonstrate their understanding of the topics covered in the training through hands-on exercises and a written test. Respirator training will be documented by the Program Administrator and the documentation will include the type, model, and size of respirator for which each employee has been trained and fit tested.

Program Evaluation

The Program Administrator will conduct periodic evaluations of the workplace to ensure that the provisions of this program are being implemented. The evaluations will include regular consultations with employees who use respirators and their supervisors, site inspections, air monitoring and a review of records.

Problems identified will be noted in an inspection log and addressed by the Program Administrator. These findings will be reported to ___Company Name___ management, and the report will list plans to correct deficiencies in the respirator program and target dates for the implementation of those corrections.

Documentation and Recordkeeping

A written copy of this program and the OSHA standard is kept __Indicate where kept__ and is available to all employees who wish to review it.

Also maintained __Indicate where kept__ are copies of training and fit test records.

These records will be updated as new employees are trained, as existing employees receive refresher training, and as new fit tests are conducted.

The Program Administrator will also maintain copies of the medical records for all employees covered under the respirator program. The completed medical questionnaire and the physician/PLHCP documented findings are confidential and will remain at __Indicate physician/PLHCP__ maintaining these records. The company will only retain the physician/PLHCP's written recommendation regarding each employee's ability to wear a respirator.

Voluntary Respirator Use

Voluntary use of respirators is allowed during the following procedures/work areas:

List the type of process/work area and the respirator used

_____

_____

_____

_____

_____

If filtering face pieces(dust masks) are voluntarily worn the Program Administrator will provide these employees with the information contained in Appendix D of the standard. (Appendix D details the requirements for voluntary use of respirators by employees and is available at www.osha.gov.)

Employees choosing to wear a half facepiece APR in addition to being provided with Appendix D, must comply with the procedures for Medical Evaluation, Respirator Use, and Cleaning, Maintenance and Storage. The Program Administrator will only allow voluntary respirator use after it has been determined that the respirator itself will not create a hazard.

Acronyms

APR = Air Purifying Respirator

IDLH = Immediately Dangerous to Life and Health

NIOSH = National Institute for Occupational Safety and Health

OSHA = Occupational Safety and Health Administration

PLHCP = Physician or Other Licensed Healthcare Professional

ppm = parts per million

SAR = Supplied Air Respirator

SCBA = Self Contained Breathing Apparatus

Noise
1910.95

The Occupational Safety and Health Administration (OSHA) Noise Standard (1910.95) addresses noise exposure in the workplace by requiring a hearing conservation program whenever employee noise exposures equal or exceed an 8-hour, time-weighted average sound level (TWA) of 85 decibels. When employee monitoring indicates any employee's exposure may equal or exceed an 8-hour, time-weighted average of 85 decibels, the employer shall develop and implement a hearing conservation program that requires annual hearing exams often referred to an audiometric exams, employee training on the hazards of noise and the employer must provide employees with a variety of hearing protections to choose from. The audiometric testing must be made available at no cost to employees. Once noise levels exceed 90 decibels in an 8-hour day the hearing protection must be mandatory.

Work-Related Hearing Loss

Work- related hearing loss continues to be a critical workplace safety and health issue. The National Institute for Occupational Safety and Health (NIOSH) and the occupational safety and health community named hearing loss one of the 21 priority areas for research in the next century. Noise-induced hearing loss is 100% preventable but once acquired, hearing loss is permanent and irreversible. Therefore, prevention measures must be taken by employers and workers to ensure the protection of workers' hearing.

Magnitude

Approximately 30 million workers are exposed to hazardous noise on the job and an additional nine million are at risk for hearing loss from other agents such as solvents and metals.

Noise-induced hearing loss is one of the most common occupational diseases and the second most self-reported occupational illness or injury. Industry specific studies reveal:

- 44% of carpenters and 48% of plumbers reported that they had a perceived hearing loss.
- 90% of coal miners will have a hearing impairment by age 52 (compared to 9% of the general population); 70% of male metal/nonmetal miners will experience a hearing impairment by age 60.

While any worker can be at risk for noise-induced hearing loss in the workplace, workers in many industries have higher exposures to dangerous levels of noise. Industries with high numbers of exposed workers include: agriculture, mining, construction, manufacturing and utilities, transportation, and military.

Costs

There is no national surveillance or injury reporting system for hearing loss. As such, comprehensive data on the economic impact of hearing loss are not available. Some estimates find that occupational hearing loss compensation costs alone are in the hundreds of missions of dollars per year. The following examples provide an indication of the economic burden of occupational hearing loss.

Washington State, workers' compensation disability settlements for hearing-related conditions cost $4.8 million in 1991. This figure does not include medical costs or personal costs which can include $1500 for a hearing aid and around $300 per year for batteries. Moreover, workers' compensation data are an underestimate of the true frequency of occupational illness, representing only the tip of the iceberg.

In British Columbia, in the five-year period from 1994 to 1998, the worker's compensation board paid $18 million in permanent disability awards to 3,207 workers suffering hearing loss. An additional $36 million was paid out for hearing aids.

Through their hearing conservation program, The U.S. Army **saved** $504.3 million by reducing hearing loss among combat arms personnel between 1974 and 1994. Between 1987 and 1997, as a result of military efforts to reduce civilian hearing loss, the Department of Veterans Affairs saved $220.8 million and the Army an additional $149 million.

Prevention

Removing hazardous noise from the workplace through engineering controls (e.g. installing a muffler or building an acoustic barrier) is the most effective way to prevent noise-induced hearing loss. Hearing protectors such as ear plugs and ear muffs should be used when it is not feasible to otherwise reduce noise to be a safe level. NIOSH recommends hearing loss prevention programs for all workplaces with hazardous levels of noise. These programs should include noise assessments, engineering controls, audiometric monitoring of workers hearing, appropriate use of hearing protectors, worker education, recordkeeping, and program evaluation.

For more information on occupational hearing loss or other work-related injuries or illnesses contact NIOSH at 1-800-35-NIOSH or visit the NIOSH web site at http://www.cdc.gov/niosh.

OSHA FACT Sheet

Recordkeeping

Highlights of OSHA's Recordkeeping Rule

OSHA's rule addressing the recording and reporting of occupational injuries and illnesses affects approximately 1.4 million establishments. A number of specific industries in the retail, service, finance, insurance, and real estate sectors that are classified as low hazard are exempt from most requirements of the rule as are small businesses with 10 or fewer employees.

The revised rule takes effect January 1, 2002, except for provisions covering hearing loss and musculoskeletal disorders, which OSHA is delaying for 1 year — until January 1, 2003 — while the agency reconsiders these issues. The new rule improves employee involvement, calls for greater employee privacy protection, creates simpler forms, provides clearer regulatory requirements, and allows employers more flexibility to use computers to meet OSHA regulatory requirements. Following is a brief summary of key provisions of the rule.

- Updates three recordkeeping forms:
  - OSHA Form 300 (*Log of Work-Related Injuries and Illnesses*); simplified and printed on smaller, legal size paper.
  - OSHA Form 301 (*Injury and Illness Incident Report*); includes more data about how the injury or illness occurred.
  - OSHA Form 300A (*Summary of Work-Related Injuries and Illnesses*); a new form created to make it easier to post and calculate incidence rates.
- Provides a single set of recording criteria for both work-related injuries and work-related illnesses. (The former rule required employers to record all illnesses, regardless of severity.)
- Requires records to include a work-related injury or illness resulting in one of the following: death, days away from work, restricted work or transfer to another job, medical treatment **beyond** first aid, loss of consciousness, or diagnosis of a significant injury or illness by a physician or other licensed health care professional.
- Includes new definitions of medical treatment, first aid, and restricted work to simplify recording decisions.
- Requires a **significant** degree of aggravation before a preexisting injury or illness is considered work related.
- Adds further exceptions to the definition of work-relatedness to limit recording of cases involving eating and drinking of food and beverages, common colds and flu, blood donations, exercise programs, mental illnesses, etc.
- Clarifies the recording of "light duty" or restricted work cases. Requires employers to record cases when the injured or ill employee is restricted from "routine job functions," which are defined as work activities the employee regularly performs at least once weekly.
- Requires employers to record all needlestick and sharps injuries involving contamination by another person's blood or other potentially infectious materials.

- Includes separate provisions describing the recording criteria for cases involving the work-related transmission of tuberculosis.
- Eliminates the term "lost workdays" and requires recording of days away from work or days restricted or days transferred to another job. Calls for employers to count calendar days rather than workdays.
- Requires employers to establish a procedure for employees to report injuries and illnesses and tell their employees how to report. (Employers are **prohibited** from discriminating against employees who do report by Section 11(c) of the *Occupational Safety and Health Act of 1970.*)
- For the first time, employees and former employees will be guaranteed access to their individual OSHA 301 forms. Employee representatives will be provided access to the "information about the case" section of the OSHA 301 form in establishments where they represent employees.
- Protects employee privacy by (1) prohibiting employers from entering an individual's name on Form 300 for certain types of injuries or illnesses (e.g., sexual assaults, HIV infections, mental illnesses); (2) allowing employers not to describe the nature of sensitive injuries where the employee's identity would be known; (3) giving employee representatives access only to the portion of Form 301 that contains no personal information; and (4) requiring employers to remove employees' names before providing the data to persons not provided access rights under the rule.
- Requires the annual summary to be posted for 3 months instead of 1. Requires certification of the summary by a company executive.
- Excludes some public transportation and motor vehicle accidents from the reporting of fatalities and catastrophes.
- States that operate their own job safety and health programs will be adopting comparable recordkeeping rules that will also be effective January 1, 2002. States must have the same requirements for which injuries and illnesses are recordable and how they are recorded. However, other provisions, such as industry exemptions, may be different as long as they are as stringent as the federal requirements.

U.S. Department of Labor
Occupational Safety
and Health Administration
2001

OSHA's *Form 300* (Rev. 01/2004)

Log of Work-Related Injuries and Illnesses

Attention: This form contains information relating to employee health and must be used in a manner that protects the confidentiality of employees to the extent possible while the information is being used for occupational safety and health purposes.

Year 20____

U.S. Department of Labor
Occupational Safety and Health Administration

You must record information about every work-related death and about every work-related injury or illness that involves loss of consciousness, restricted work activity or job transfer, days away from work, or medical treatment beyond first aid. You must also record significant work-related injuries and illnesses that are diagnosed by a physician or licensed health care professional. You must also record work-related injuries and illnesses that meet any of the specific recording criteria listed in 29 CFR Part 1904.8 through 1904.12. Feel free to use two lines for a single case if you need to. You must complete an Injury and Illness Incident Report (OSHA Form 301) or equivalent form for each injury or illness recorded on this form. If you're not sure whether a case is recordable, call your local OSHA office for help.

Establishment name ________________

City ____________ State ______

Identify the person			Describe the case			Classify the case: CHECK ONLY ONE box for each case based on the most serious outcome for that case:				Enter the number of days the injured or ill worker was:		Check the "Injury" column or choose one type of illness: (M)					
								Remained at Work									
(A) Case no.	(B) Employee's name	(C) Job title (e.g., Welder)	(D) Date of injury or onset of illness	(E) Where the event occurred (e.g., Loading dock north end)	(F) Describe injury or illness, parts of body affected, and object/substance that directly injured or made person ill (e.g., Second degree burns on right forearm from acetylene torch)	Death (G)	Days away from work (H)	Job transfer or restriction (I)	Other record-able cases (J)	Away from work (K)	On job transfer or restriction (L)	Injury (1)	Skin disorder (2)	Respiratory condition (3)	Poisoning (4)	Hearing loss (5)	All other illnesses (6)
___	___	___	__/__ month/day	___	___	☐	☐	☐	☐	__ days	__ days	☐	☐	☐	☐	☐	☐
___	___	___	__/__ month/day	___	___	☐	☐	☐	☐	__ days	__ days	☐	☐	☐	☐	☐	☐
___	___	___	__/__ month/day	___	___	☐	☐	☐	☐	__ days	__ days	☐	☐	☐	☐	☐	☐
___	___	___	__/__ month/day	___	___	☐	☐	☐	☐	__ days	__ days	☐	☐	☐	☐	☐	☐
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___	___	___	__/__ month/day	___	___	☐	☐	☐	☐	__ days	__ days	☐	☐	☐	☐	☐	☐
					Page totals	___	___	___	___	___	___	___	___	___	___	___	___
												Injury (1)	Skin disorder (2)	Respiratory condition (3)	Poisoning (4)	Hearing loss (5)	All other illnesses (6)

Be sure to transfer these totals to the Summary page (Form 300A) before you post it.

Page __ of __

OSHA's Form 300A (Rev. 01/2004)

Summary of Work-Related Injuries and Illnesses

Year 20__ __

U.S. Department of Labor
Occupational Safety and Health Administration

Form approved OMB no. 1220-0176

All establishments covered by Part 1904 must complete this Summary page, even if no work-related injuries or illnesses occurred during the year. Remember to review the Log to verify that the entries are complete and accurate before completing this summary.

Using the Log, count the individual entries you made for each category. Then write the totals below, making sure you've added the entries from every page of the Log. If you had no cases, write "0."

Employees, former employees, and their representatives have the right to review the OSHA Form 300 in its entirety. They also have limited access to the OSHA Form 301 or its equivalent. See 29 CFR Part 1904.35, in OSHA's recordkeeping rule, for further details on the access provisions for these forms.

Number of Cases

Total number of deaths	Total number of cases with days away from work	Total number of cases with job transfer or restriction	Total number of other recordable cases
_____	_____	_____	_____
(G)	(H)	(I)	(J)

Number of Days

Total number of days away from work	Total number of days of job transfer or restriction
_____	_____
(K)	(L)

Injury and Illness Types

Total number of . . .

	(M)		
(1) Injuries	_____	(4) Poisonings	_____
		(5) Hearing loss	_____
(2) Skin disorders	_____	(6) All other illnesses	_____
(3) Respiratory conditions	_____		

Post this Summary page from February 1 to April 30 of the year following the year covered by the form.

Public reporting burden for this collection of information is estimated to average 50 minutes per response, including time to review the instructions, search and gather the data needed, and complete and review the collection of information. Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number. If you have any comments about these estimates or any other aspects of this data collection, contact: US Department of Labor, OSHA, Office of Statistical Analysis, Room N-3644, 200 Constitution Avenue, NW, Washington, DC 20210. Do not send the completed forms to this office.

Establishment information

Your establishment name _____

Street _____

City _____ State _____ ZIP _____

Industry description (e.g., *Manufacture of wood truck trailers*)

_____

Standard Industrial Classification (SIC), if known (e.g., 7515)

___ ___ ___ ___

OR

North American Industrial Classification (NAICS), if known (e.g., 336212)

___ ___ ___ ___ ___ ___

Employment information

(If you don't have these figures, see the Worksheet on the back of this page to estimate.)

Annual average number of employees _____

Total hours worked by all employees last year _____

Sign here

Knowingly falsifying this document may result in a fine.

I certify that I have examined this document and that to the best of my knowledge the entries are true, accurate, and complete.

_____ _____

Company executive Title

_____ _____

Phone Date

Optional

Worksheet to Help You Fill Out the Summary

At the end of the year, OSHA requires you to enter the average number of employees and the total hours worked by your employees on the summary. If you don't have these figures, you can use the information on this page to estimate the numbers you will need to enter on the Summary page at the end of the year.

How to figure the average number of employees who worked for your establishment during the year:

❶ ***Add*** the total number of employees your establishment paid in all pay periods during the year. Include all employees: full-time, part-time, temporary, seasonal, salaried, and hourly.

The number of employees paid in all pay periods = ❶ _____

❷ ***Count*** the number of pay periods your establishment had during the year. Be sure to include any pay periods when you had no employees.

The number of pay periods during the year = ❷ _____

❸ ***Divide*** the number of employees by the number of pay periods.

❶ _____ / ❷ _____ = ❸ _____

❹ ***Round the answer*** to the next highest whole number. Write the rounded number in the blank marked *Annual average number of employees.*

The number rounded = ❹ _____

For example, Acme Construction figured its average employment this way:

For pay period...	Acme paid this number of employees...	
1	10	Number of employees paid = 830 ❶
2	6	
3	15	Number of pay periods = 26 ❷
4	30	
5	40	830 / 26 = 31.92 ❸
▼	▼	
24	20	31.92 rounds to 32 ❹
25	15	
26	+10	32 is the annual average number of employees
	830	

How to figure the total hours worked by all employees:

Include hours worked by salaried, hourly, part-time and seasonal workers, as well as hours worked by other workers subject to day to day supervision by your establishment (e.g., temporary help services workers).

Do not include vacation, sick leave, holidays, or any other non-work time, even if employees were paid for it. If your establishment keeps records of only the hours paid or if you have employees who are not paid by the hour, please estimate the hours that the employees actually worked.

If this number isn't available, you can use this optional worksheet to estimate it.

Optional Worksheet

_____ ***Find*** the number of full-time employees in your establishment for the year.

X _____ ***Multiply*** by the number of work hours for a full-time employee in a year.

_____ This is the number of full-time hours worked.

\+ _____ ***Add*** the number of any overtime hours as well as the hours worked by other employees (part-time, temporary, seasonal)

_____ ***Round*** the answer to the next highest whole number. Write the rounded number in the blank marked *Total hours worked by all employees last year.*

U.S. Department of Labor
Occupational Safety and Health Administration

OSHA's Form 301
Injury and Illness Incident Report

Attention: This form contains information relating to employee health and must be used in a manner that protects the confidentiality of employees to the extent possible while the information is being used for occupational safety and health purposes.

U.S. Department of Labor
Occupational Safety and Health Administration

Form approved OMB no. 1220-0176

This *Injury and Illness Incident Report* is one of the first forms you must fill out when a recordable work-related injury or illness has occurred. Together with the *Log of Work-Related Injuries and Illnesses* and the accompanying Summary, these forms help the employer and OSHA develop a picture of the extent and severity of work-related incidents.

Within 7 calendar days after you receive information that a recordable work-related injury or illness has occurred, you must fill out this form or an equivalent. Some state workers' compensation, insurance, or other reports may be acceptable substitutes. To be considered an equivalent form, any substitute must contain all the information asked for on this form.

According to Public Law 91-596 and 29 CFR 1904, OSHA's recordkeeping rule, you must keep this form on file for 5 years following the year to which it pertains.

If you need additional copies of this form, you may photocopy and use as many as you need.

Completed by _____

Title _____

Phone (____)____-____ Date ____/____/____

Information about the employee

1) Full name _____

2) Street _____

City _____ State _____ ZIP _____

3) Date of birth ____/____/____

4) Date hired ____/____/____

5) ☐ Male
☐ Female

Information about the physician or other health care professional

6) Name of physician or other health care professional _____

_____

7) If treatment was given away from the worksite, where was it given?

Facility _____

Street _____

City _____ State _____ ZIP _____

8) Was employee treated in an emergency room?
☐ Yes
☐ No

9) Was employee hospitalized overnight as an in-patient?
☐ Yes
☐ No

Information about the case

10) Case number from the Log _____ (Transfer the case number from the Log after you record the case.)

11) Date of injury or illness ____/____/____

12) Time employee began work _____ AM / PM

13) Time of event _____ AM / PM ☐ Check if time cannot be determined

14) **What was the employee doing just before the incident occurred?** Describe the activity, as well as the tools, equipment, or material the employee was using. Be specific. *Examples:* "climbing a ladder while carrying roofing materials"; "spraying chlorine from hand sprayer"; "daily computer key-entry."

15) **What happened?** Tell us how the injury occurred. *Examples:* "When ladder slipped on wet floor, worker fell 20 feet"; "Worker was sprayed with chlorine when gasket broke during replacement"; "Worker developed soreness in wrist over time."

16) **What was the injury or illness?** Tell us the part of the body that was affected and how it was affected; be more specific than "hurt," "pain," or sore." *Examples:* "strained back"; "chemical burn, hand"; "carpal tunnel syndrome."

17) **What object or substance directly harmed the employee?** *Examples:* "concrete floor"; "chlorine"; "radial arm saw." *If this question does not apply to the incident, leave it blank.*

18) **If the employee died, when did death occur?** Date of death ____/____/____

Silica
1910.1000

Silica exposure can be a serious threat to landscaping workers. Exposure to respirable crystalline silica dust can occur during certain landscaping operations, such as rock grinding or rock cutting. Overexposure to silica can cause silicosis, a type of pneumoconiosis that is caused by inhalation of fine dust containing crystalline silica (free silica). It is a disabling, progressive, and sometimes fatal disease. In 1994, OSHA initiated a Special Emphasis Program for crystalline silica that involved extensive public outreach to encourage the implementation of incidence of silicosis. OSHA has set silica exposure limits for its use in the workplace. Air monitoring should be conducted to determine silica exposure and can be provided free of charge by contacting the Massachusetts Consultation Program at the number on the cover of this manual. To reduce employee exposure to silica companies should institute engineering controls such as cutting wet and/or ventilation. Respiratory protection may also be used if engineering controls fail to reduce employee exposure below the allowable limits.

OSHA FACT Sheet

Crystalline Silica Exposure
Health Hazard Information

What is crystalline silica?

Crystalline silica is a basic component of soil, sand, granite, and many other minerals. Quartz is the most common form of crystalline silica. Cristobalite and tridymite are two other forms of crystalline silica. All three forms may become respirable size particles when workers chip, cut, drill, or grind objects that contain crystalline silica.

What are the hazards of crystalline silica?

Silica exposure remains a serious threat to nearly 2 million U.S. workers, including more than 100,000 workers in high risk jobs such as abrasive blasting, foundry work, stonecutting, rock drilling, quarry work and tunneling. The seriousness of the health hazards associated with silica exposure is demonstrated by the fatalities and disabling illnesses that continue to occur in sandblasters and rockdrillers. Crystalline silica has been classified as a human lung carcinogen. Additionally, breathing crystalline silica dust can cause **silicosis**, which in severe cases can be disabling, or even fatal. The respirable silica dust enters the lungs and causes the formation of scar tissue, thus reducing the lungs' ability to take in oxygen. There is no cure for silicosis. Since silicosis affects lung function, it makes one more susceptible to lung infections like **tuberculosis.** In addition, smoking causes lung damage and adds to the damage caused by breathing silica dust.

What are the symptoms of silicosis?

Silicosis is classified into three types: chronic/classic, accelerated, and acute.

Chronic/classic silicosis, the most common, occurs after 15–20 years of moderate to low exposures to respirable crystalline silica. Symptoms associated with chronic silicosis may or may not be obvious; therefore, workers need to have a chest x-ray to determine if there is lung damage. As the disease progresses, the worker may experience shortness of breath upon exercising and have clinical signs of poor oxygen/carbon dioxide exchange. In the later stages, the worker may experience fatigue, extreme shortness of breath, chest pain, or respiratory failure.

Accelerated silicosis can occur after 5–10 years of high exposures to respirable crystalline silica. Symptoms include severe shortness of breath, weakness, and weight loss. The onset of symptoms takes longer than in acute silicosis.

Acute silicosis occurs after a few months or as long as 2 years following exposures to extremely high concentrations of respirable crystalline silica. Symptoms of acute silicosis include severe disabling shortness of breath, weakness, and weight loss, which often leads to death.

Where are construction workers exposed to crystalline silica?

Exposure occurs during many different construction activities. The most severe exposures generally occur during abrasive blasting with sand to remove paint and rust from bridges, tanks, concrete structures, and other surfaces. Other construction activities that may result in severe exposure include: jack hammering, rock/well drilling, concrete mixing, concrete drilling, brick and concrete block cutting and sawing, tuck pointing, tunneling operations.

Where are general industry employees exposed to crystalline silica dust?

The most severe exposures to crystalline silica result from abrasive blasting, which is done to clean and smooth irregularities from molds, jewelry, and foundry castings, finish tombstones, etch or frost glass, or remove paint, oils, rust, or dirt form objects needing to be repainted or treated. Other exposures to silica dust occur in cement and brick manufacturing, asphalt pavement manufacturing, china and ceramic manufacturing and the tool and die, steel and foundry industries. Crystalline silica is used in manufacturing, household abrasives, adhesives, paints, soaps, and glass. Additionally, crystalline silica exposures occur in the maintenance, repair and replacement of refractory brick furnace linings.

In the maritime industry, shipyard employees are exposed to silica primarily in abrasive blasting operations to remove paint and clean and prepare steel hulls, bulkheads, decks, and tanks for paints and coatings.

How is OSHA addressing exposure to crystalline silica?

OSHA has an established Permissible Exposure Limit, or PEL, which is the maximum amount of crystalline silica to which workers may be exposed during an 8-hour work shift (29 *CFR* 1926.55, 1910.1000). OSHA also requires hazard

Crystalline Silica Exposure
Health Hazard Information

communication training for workers exposed to crystalline silica, and requires a repirator protection program until engineering controls are implemented. Additionally, OSHA has a National Emphasis Program (NEP) for Crystalline Silica exposure to identify, reduce, and eliminate health hazards associated with occupational exposures.

What can employers/employees do to protect against exposures to crystalline silica?

- Replace crystalline silica materials with safer substitutes, whenever possible.
- Provide engineering or administrative controls, where feasible, such as local exhaust ventilation, and blasting cabinets. Where necessary to reduce exposures below the PEL, use protective equipment or other protective measures.
- Use all available work practices to control dust exposures, such as water sprays.
- Wear only a N95 NIOSH certified respirator, if respirator protection is required. Do not alter the respirator. Do not wear a tight-fitting respirator with a beard or mustache that prevents a good seal between the respirator and the face.
- Wear only a Type CE abrasive-blast supplied-air respirator for abrasive blasting.
- Wear disposable or washable work clothes and shower if facilities are available. Vacuum the dust from your clothes or change into clean clothing before leaving the work site.
- Participate in training, exposure monitoring, and health screening and surveillance programs to monitor any adverse health effects caused by crystalline silica exposures.
- Be aware of the operations and job tasks creating crystalline silica exposures in your workplace environment and know how to protect yourself.
- Be aware of the health hazards related to exposures to crystalline silica. Smoking adds to the lung damage caused by silica exposures.
- Do not eat, drink, smoke, or apply cosmetics in areas where crystalline silica dust is present. Wash your hands and face outside of dusty areas before performing any of these activities.
- Remember: If it's silica, it's not just dust.

How can I get more information on safety and health?

OSHA has various publications, standards, technical assistance, and compliance tools to help you, and offers extensive assistance through workplace consultation, voluntary protection programs, strategic partnerships, alliances, state plans, grants, training, and education. OSHA's *Safety and Health Program Management Guidelines* (*Federal Register* 54:3904-3916, January 26, 1989) detail elements critical to the development of a successful safety and health management system. This and other information are available on OSHA's website.

- For one free copy of OSHA publications, send a self-addressed mailing label to OSHA Publications Office, 200 Constitution Avenue N.W., N-3101, Washington, DC 20210; or send a request to our fax at (202) 693–2498, or call us toll-free at (800) 321–OSHA.
- To order OSHA publications online at **www.osha.gov**, go to **Publications** and follow the instructions for ordering.
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This is one in a series of informational fact sheets highlighting OSHA programs, policies, or standards. It does not impose any new compliance requirements. For a comprehensive list of compliance requirements of OSHA standards or regulations, refer to *Title 29 of the Code of Federal Regulations*. This information will be made available to sensory-impaired individuals upon request. The voice phone is (202) 693–1999. See also OSHA's website at **www.osha.gov**.

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OSHA
Occupational Safety and Health Administration
U.S. Department of Labor
2002

Trenching

Cave-ins are perhaps the most feared trenching hazard. But other potentially fatal hazards exist, including asphyxiation due to lack of oxygen in a confined space, inhalation of toxic fumes, drowning, etc. Electrocution or explosions can occur when workers contact underground utilities.

OSHA requires that workers in trenches and excavations be protected, and that safety and health programs address the variety of hazards they face. The following hazards cause the most trenching and excavation injuries:

No Protective System

All excavations are hazardous because they are inherently unstable. If they are restricted spaces they present the additional risks of oxygen depletion, toxic fumes, and water accumulation. If you are not using protective systems or equipment while working in trenches or excavations at your site, you are in danger of suffocating, inhaling toxic materials, fire, drowning, or being crushed by a cave-in.

Pre-job planning is vital to accident-free trenching; safety cannot be improvised as work progresses. The following concerns must be addressed by a competent person:

Evaluate soil conditions [1926 Subpart P Appendix A] and select appropriate protective systems [1926 Subpart P Appendix F].

Construct protective systems in accordance with the standard requirements [1926.652].

Preplan; contact utilities (gas, electric) to locate underground lines, plan for traffic control if necessary, determine proximity to structures that could affect choice of protective system.

Test for low oxygen, hazardous fumes and toxic gases, especially when gasoline engine-driven equipment is running, or the dirt has been contaminated by leaking lines or storage tanks. Insure adequate ventilation or respiratory protection if necessary.

Provide safe access into and out of the excavation.

Provide appropriate protections if water accumulation is a problem.

Inspect the site daily at the start of each shift, following a rainstorm, or after any other hazard-increasing event.

Keep excavations open the minimum amount of time needed to complete operations.

Failure to Inspect Trench and Protective Systems

If trenches and excavations at your site are not inspected daily for evidence of possible cave-ins, hazardous atmospheres, failure of protective systems, or other unsafe conditions, you are in danger.

Inspect excavations:

- Before construction begins.
- Daily before each shift.
- As needed throughout the shift.
- Following rainstorms or other hazard-increasing events (such as a vehicle or other equipment approaching the edge of an excavation).

Inspections must be conducted by a competent person who:

- Has training in soil analysis.
- Has training in the use of protective systems.
- Is knowledgeable about the OSHA requirements.
- Has authority to immediately eliminate hazards.

Unsafe Spoil-Pile Placement

Excavated material (spoils) at your site are hazardous if they are set too close to the edge of a trench/excavation. The weight of the spoils can cause a cave-in, or spoils and equipment can roll back on top of workers, causing serious injuries or death.

Provide protection by one or more of the following:

- Set spoils and equipment at least 2 feet back from the excavation.
- Use retaining devices, such as a trench box, that will extend above the top of the trench to prevent equipment and spoils from falling back into the excavation.
- Where the site does not permit a 2-foot set back, spoils may need to be temporarily hauled to another location.

Unsafe Access/Egress

To avoid fall injuries during normal entry and exit of a trench or excavation at your job site, ladders, stairways, or ramps are required. In some circumstances, when conditions in a trench or excavation become hazardous, survival may even depend on how quickly you can climb out.

- Provide stairways, ladders, ramps, or other safe means of egress in all trenches that are 4 feet deep or more.
- Position means of egress within 25 lateral feet of workers.
- Structural ramps that are used solely for access or egress from excavations must be designed by a competent person.
- When two or more components form a ramp or runway, they must be connected to prevent displacement, and be of uniform thickness.
- Cleats or other means of connecting runway components must be attached in a way that would not cause tripping (e.g., to the bottom of the structure).
- Structural ramps used in place of steps must have a non-slip surface.
- Use earthen ramps as a means of egress only if a worker can walk them in an upright position, and only if they have been evaluated by a competent person. These workers are not protected from a cave-in, nor do they have any apparent safe access or egress from the trench.

Guide for Daily Inspection of Trenches and Excavations

Project:		Date:	Weather:	Soil Type:
Trench Depth:	Length:	Width:	Type of Protective System:	

Yes	No	N/A	Excavation
			Excavations and Protective Systems inspected by Competent Person by daily, before start of work.
			Competent Person has authority to remove workers from excavation immediately.
			Surface encumbrances supported or removed.
			Employees protected from loose rock or soil.
			Hard hats worn by all employees.
			Spoils, materials, and equipment set back a minimum of 2' from edge of excavation.
			Barriers provided at all remote excavations, wells, pits, shafts, etc.
			Walkways and bridges over excavations 6' or more in depth equipped with guardrails.
			Warning vests, or other highly visible PPE provided and worn by all employees exposed to vehicular traffic.
			Employees prohibited from working or walking under suspended loads.
			Employees prohibited from working on faces of sloped or benched excavations above other employees.
			Warning system established and used when mobile equipment is operating near edge of excavation.

Yes	No	N/A	Utilities
			Utility companies contacted and/or utilities located.
			Exact location of utilities marked when near excavation.
			Underground installations protected, supported, or removed when excavation is open.

Yes	No	N/A	Wet Conditions
			Precautions taken to protect employees from accumulation of water.
			Water removal equipment monitored by Competent Person.
			Surface water controlled or diverted.
			Inspection made after each rainstorm.

Yes	No	N/A	Hazardous Atmosphere
			Atmosphere tested when there is a possibility of oxygen deficiency or build-up of hazardous gases.
			Oxygen content is between 19.5% and 21%.
			Ventilation provided to prevent flammable gas build-up to 20% of lower explosive limit of the gas.
			Testing conducted to ensure that atmosphere remains safe.
			Emergency Response Equipment readily available where a hazardous atmosphere could or does exist.
			Employees trained in the use of Personal Protective and Emergency Response Equipment.
			Safety harness and life line individually attended when employees enter deep confined excavation.

Signature of Competent Person. Date	

APPENDIX V: 2-1. **SITE ASSESSMENT QUESTIONS**

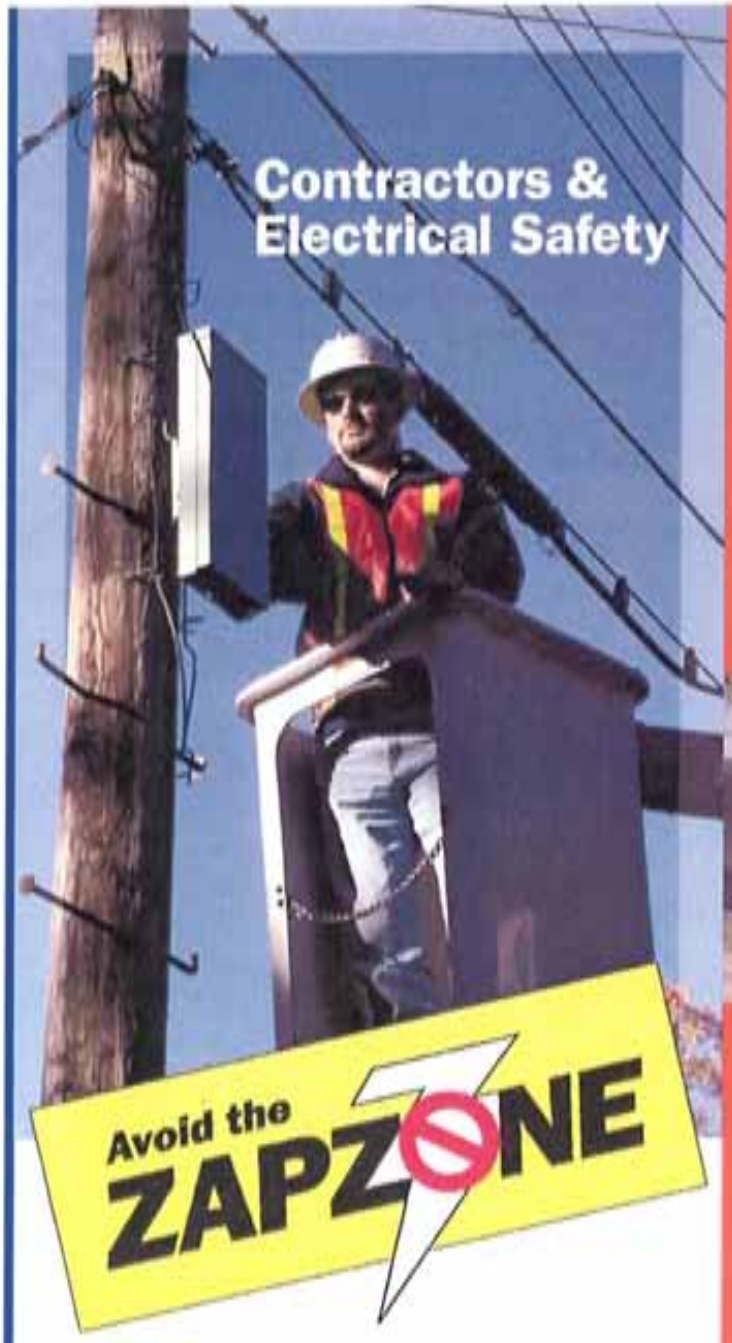
During first and subsequent visits to a construction or facility maintenance location, the compliance officer (or the site's safety officer or other competent person) may find the following questions useful.

1. Is the cut, cavity, or depression a trench or an excavation?
2. Is the cut, cavity, or depression more than 4 ft (1.2 m) in depth?
3. Is there water in the cut, cavity, or depression?
4. Are there adequate means of access and egress?
5. Are there any surface encumbrances?
6. Is there exposure to vehicular traffic?
7. Are adjacent structures stabilized?
8. Does mobile equipment have a warning system?
9. Is a competent person in charge of the operation?
10. Is equipment operating in or around the cut, cavity, or depression?
11. Are procedures required to monitor, test, and control hazardous atmospheres?
12. Does a competent person determine soil type?
13. Was a soil testing device used to determine soil type?
14. Is the spoil placed 2 ft (0.6 m) or more from the edge of the cut, cavity, or depression?
15. Is the depth 20 ft (6.1 m) or more for the cut, cavity, or depression?
16. Has a registered professional engineer approved the procedure if the depth is more than 20 ft (6.1 m)?
17. Does the procedure require benching or multiple benching? Shoring? Shielding?
18. If provided, do shields extend at least 18 in (0.5 m) above the surrounding area if it is sloped toward the excavation?
19. If shields are used, is the depth of the cut more than 2 ft (0.6 m) below the bottom of the shield? Are any required surface crossings of the cut, cavity, or depression the proper width and fitted with hand rails?
21. Are means of egress from the cut, cavity, or depression no more than 25 ft (7.6m) from the work?
22. Is emergency rescue equipment required?
23. Is there documentation of the minimum daily excavation inspection?

Electrical

Historically Federal OSHA has issued citations to Landscapers and Arborists under OSHA's General Industry Regulations. Landscapers and arborists could be subject to subpart S of those regulations, which essentially deals with electrical systems. This subpart would cover the base of operations and would address electrical systems and equipment a landscaper or arborist might occupy and/or use. Additionally subpart P [1910.243] covers portable power tools, which could be used occasionally in both industries. Use and operation of chain saws is also covered under this part. Different types of mowers to include power lawnmowers, walk behind and riding mowers are covered under the subpart 1910.234 (e)(1) through (e)(4).

Subpart R of the regulations applies primarily to Special Industries. Federal OSHA has issued citations under this standard for arborists and landscapers engaged in tree trimming operations [1910.269 (a)(1)(i)(E)].



National Grid

Avoid the ZAPZONE

What is the ZapZone?

The ZapZone is the minimum 10-foot danger zone around power lines.

Transmission or high-voltage lines require an even greater clearance.

Working Near Power Lines

Overhead power lines are NOT insulated, and carry enough energy to cause serious injury or even death. Regard all wires as live. Stay safe by staying clear of the ZapZone.

- Keep scaffolding and staging away from electrical equipment and overhead lines.
- Beware of power lines when installing television or other rooftop antennas.
- Stay clear of the 10-foot ZapZone around the wires connecting homes and commercial buildings to the electric system.

Painters, Masons, Framers, Siding Contractors, Plumbers, Tree Trimmers

- Stay alert. Keep Ladders out of the ZapZone when carrying, moving, and raising them.
- Keep away from wires when working with tools, pipe, lumber, or siding – all of which can conduct electricity.
- Make sure the area is clear of wires before working near trees or shrubs.

Communications Contractors

- Stay out of the ZapZone – keep yourself, your co-workers, and vehicles at least 10 feet away from residential electric lines and equipment.
- Know the location of power lines and electrical equipment including risers, capacitor banks, fuses, and transformers when climbing utility poles or working in a bucket truck.
- Never attach or tie anything off to powerlines or electrical equipment.

At the Job Site

- Keep all vehicles and heavy machinery – cranes, bucket and dump trucks, backhoes, front-end loaders, and cement pumpers – out of the ZapZone around power lines.
- If a machine's boom or bucket gets into the ZapZone or touches a live wire or conductor, anyone touching it – or even standing near the machine – is at risk of being injured.
- Designate at least one employee to observe and ensure the minimum ZapZone clearance around power lines is maintained.
- Always have a safety meeting at the site before the job begins. Be sure all subcontractors on the job are aware of safety issues and adhere to site safety rules.

Important Telephone Information

When Digging

New England

3 Days before digging anywhere you must call:

DIGSAFE **1-888-DIGSAFE (344-7233)**

Its the law, and its free.

(This phone number covers participating utilities in Massachusetts, Maine, New Hampshire, Rhode Island, and Vermont.)

New York

Two full days before digging anywhere, call:

Dig Safely NY **1-800-962-7962**

(This phone number covers participating utilities in New York State, except New York City and Long Island.)

Power Line Safety

New England

Massachusetts Electric, Narragansett Electric
Granite State Electric, Nantucket Electric

When working near power lines or high voltage lines first call:

Hazard Identification Hotline **1-888-625-3723**

New York

Niagara Mohawk

Contractors can call **1-800-Niagara** (1-800-642-2472) to reach an operator who will respond to safety concerns, inquiries, requests and to accept site ready construction orders.

Tool Box Safety Tips

- Use only grounded power tools with a three-pronged plug, or that are double insulated.
- Never carry a power tool by its cord.
- Always unplug power tools before cleaning servicing, or repairing them.
- Obey all manufacturers' safety instructions when operating power tools.
- Never use power tools or electric equipment outdoors in wet weather or near wet surfaces.

Avoid the ZAPZONE

Facts to Remember

- Overhead power lines are **NOT insulated** – if your body, tools, equipment, or vehicle comes into contact with a wire, the results can be deadly.
- **90%** of all power line accidents occur from contact with wires common to local streets and neighborhoods.
- **Thousands of power line accidents** occur annually involving cranes, shovels, backhoes, boom and dump trucks, and concrete pumpers. Nationwide, a hazardous contact occurs an average of **every ten minutes.**
- Power line accidents happen to professionals in **many trades**, including:
  - Crane Riggers and Operators
  - Cable television workers
  - Telecommunications Contractors
  - Home Improvement Contractors
  - Tree Trimmers
  - Painting, Roofing, Siding, and other Construction Contractors
  - Electricians
  - Utility Workers

NJ FACE

INVESTIGATION REPORT

Landscaper Electrocuted and Two Workers Seriously Injured When a Felled Tree Landed on an Overhead Power Line

October 1, 2002
Investigation: # 01-NJ-117

On October 18, 2001, a 21-year-old landscaper was electrocuted when a felled tree landed on an overhead power line and caused the power line to drop. A landscaping company had subcontracted to take down 110 trees and clear the area for a parking lot. The company hired two experienced tree trimmers to assist with tree removal. When they felled a 65-foot oak tree, one of the branches caught onto the 69,000 volt power line that was 29 feet above the ground. The porcelain insulators on the adjacent supporting utility poles broke and the power line dropped to within a few feet from the ground. The company owner's 21-year-old son was electrocuted and two workers (including the company owner) were seriously injured by the electric current.

NJ FACE investigators concluded that, to prevent similar incidents, these safety guidelines should be followed:

- **A knowledgeable person should assess each work site for safety hazards and design a work plan that addresses those hazards.**
- **The employer should conduct a job briefing, based on the work plan, before starting work.**
- **The employer should establish a written safety and health policy.**
- **Safe tree removal techniques should be used.**
- **Employers should notify the utility company when work is planned in an area near overhead power lines.**
- **Employers and employees should become familiar with available resources on safety standards and safe work practices.**

INTRODUCTION

The county medical examiner informed the FACE staff about this fatal work-related injury on October 23, 2001. The victim's employer (his father) consented, through his attorney, to participate in the FACE investigation. He was interviewed on January 22, 2002, in the presence of his attorney, immediately after the opening conference conducted by the federal Occupational Safety and Health Administration (OSHA) compliance officer. The compliance officer had been present at the incident site on the day of the fatal injury. A FACE investigator visited the site on January 22, 2002. At that time, all work had been done and construction and paving of the parking lot had been completed. Additional information was obtained from the police report, the medical examiner's report, worker interviews, a representative of the utility company that owned the power lines, and federal OSHA.

The employer was a family-owned landscaping company that had been in business for approximately twenty years and usually employed eight workers including the owner and his son. The company did landscaping, gardening, lawn maintenance and, occasionally, small tree removal. They did no tree trimming and did not climb trees. The company had no written safety program. All training was on-the-job. When new equipment was purchased, they were trained on its use by the equipment supplier. There was a verbal policy that forbade drug and alcohol use.

The victim was the 21-year-old son of the company owner. He had helped his father with jobs since his early teenage years and was considered by his father to be the company vice president. He arranged the contract for this job.

INVESTIGATION

The landscaping company was subcontracted by a paving company to remove and dispose of approximately 110 trees, as well as stumps, roots, and vegetation from a wooded area that was being cleared to extend a parking lot.

The site of the fatal injury was a wooded area being cleared to extend a corporate parking lot. Part of the area was sloping terrain and was located west of a busy 45-foot-wide road. Overhead power lines were suspended from utility poles located on the east and west sides of the road. The east pole was 39 feet from the curb and the west pole was 134 feet from the curb. The distance between the two utility poles was 218 feet. Three power lines supplied 69,000 volts, phase-to-phase. The top most line was the system ground. The lines were supported on the utility poles by porcelain insulators, each approximately 22 inches long. The height of the power lines varied, depending upon the topography of the area. At the incident site, the lowest line was 29 feet above the ground and stretched 31 feet over the road. The utility company that owns the lines maintains a right-of-way 50 feet on each side of the line, for the distance of the line. The right-of-way was clear of trees and brush.

According to the utility company representative, plans for the parking lot were developed in 2000 by an engineering firm. The engineers obtained necessary municipal permits and communicated with the utility company about their plans. They were advised by the utility company that it was necessary to coordinate with them about working in their right-of-way and they were given information about the New Jersey High Voltage Proximity Act. The utility company had not been notified that work was to be started. The landscaper received blue prints for the job from the general contractor.

The landscaping company started work at the site on October 17, 2001, late in the day. They had been there a few days earlier but left because certain permits had not been obtained. They took down trees that measured 6 to 12 inches in diameter, were 20 feet high, and grew on islands in the old parking lot. The trees were removed by cutting them at the base of the tree. The owner and work crew labored late into the evening and returned at 9:30 a.m. on October 18. Another contractor and work crew were also at the site doing excavations but were not in the immediate vicinity. The day was windy (17 miles per hour from the northwest, as measured at the nearest weather station) and clear, with a few scattered clouds. The temperature was 50 degrees Fahrenheit.

At the site were the landscaper, his son (the victim), and six landscaper laborers. With them were the company trucks, a backhoe, a rented chipper, and other landscaping equipment. Because the landscapers were not skilled at removing large trees, the employer hired two tree trimmers for the day, both with many years of experience. One of them (tree trimmer No. 1), who formerly owned his own tree care business, was an experienced tree climber and brought his own truck and chipper to the site, although they were not used. He had been trained on-the-job many years earlier by a former employer. His truck, with the chipper in tow, was parked on the street. Tree trimmer No. 2 had several years experience in tree trimming. The company laborers were busy cleaning up brush and debris left over from the previous night's work. The victim was running the chipper to dispose of the brush, logs, and trees they had removed. Very large logs were to be deposited into a dump truck and taken to a landfill.

A large hickory tree grew approximately 50 feet from the power lines. Tree trimmer No. 1 and the landscaper

removed the hickory tree after stabilizing it with the landscaper's backhoe. Tree trimmer No. 1 used his chain saw to drop the tree parallel with the power lines.

The next tree to be removed was a 65-foot-high oak tree, with a diameter of approximately 18 to 20 inches. The tree grew 52 ½ feet from the power line, just outside of the utility right-of-way, and was in full foliage. Their impression was that the tree was no more than 35 feet tall and they should have no difficulty clearing the power line by ten to twelve feet. No other workers were in the vicinity. Tree trimmer No. 2 stationed himself down the slope from them in order to give verbal and hand signal directions for cutting and dropping the tree. On receiving directions from tree trimmer No. 2, tree trimmer No. 1 told the landscaper to position his backhoe behind the oak tree, with the articulated boom against the tree, to stabilize the tree and help direct it's fall. The backhoe's outriggers were lowered to the ground after it was positioned against the tree. After warning other workers to stay clear of the area, the tree trimmer used horizontal and 45 degree cuts to make a hinge for the tree to fall. After he made the final cut, he saw the tree fall, first in the direction that he had planned, and then rolling away and in the direction of the power lines. One of the branches of the tree caught and hung onto the lowest power line, with approximately a five-foot overhang. The butt end of the tree was resting on the ground, about two feet from the stump, while the branch at the top hung on the wire. Other tree branches and foliage made contact with the next higher power line, approximately eight feet above the first. Because he wanted to free the branch from the line, tree trimmer No. 1 used his chain saw to cut two to three feet from the butt end of the tree. Since the tree was still caught on the wire, he cut off another two to three feet. The tree was still caught on the line so, for the third time, he cut another two to three feet from the tree trunk. The butt end of the tree was still resting on the ground and the top was caught on the power line. When they looked up, they saw the tree start to smoke, although there was no flame. The wind was blowing and it shook the top of the tree.

Events then occurred very quickly. Because of the weight of the tree on the line, the porcelain insulator on the western (the side of the road on which they were working) utility pole broke and the power line dropped down. The tree was still smoking. The tree trimmer put his chain saw down and alerted the landscaper to call 9-1-1, which he did. Then the porcelain insulator on the eastern pole broke and the line dropped lower. When the line dropped, it made contact with the metal chute on the chipper, parked on the street at the curb. Leaves on the ground near the curb were scorched.

The line did not break but dropped down to approximately four feet from the ground and the road. Since no workers were in the immediate area of the power line but cars were traveling on the road, the landscaper and tree trimmer No. 1 focused their attention on stopping traffic.

The landscaper and tree trimmers told the work crew to stay away from the area. For an unknown reason, a worker (who had been with the company for eight years) came into the area, through the debris, past them, and ran toward the wire (See graphic). The tree trimmer saw him and yelled for him to stop. He didn't stop but ran to the wire, crouched down, and bent under the power line. His back apparently touched the wire. Witnesses reported they saw a blue electric surge from the wire to the ground and observed the wire shaking. They also heard a loud "boom" sound. Reportedly, the injured worker did not scream but was critically burned from direct contact with the electric current.

The victim returned from the area where he had been chipping logs and brush. When he saw that his co-worker (his cousin) was badly injured, he apparently tried to rescue him and approached the area near the downed wire. He somehow made contact with the electric current. There were electric burns through his right and left shoes and socks, to his right and left foot. His lower legs and forearms also showed some burns, as well as his left hand. Seeing his son injured, his father left the road where he had been directing traffic to help his son. The witness heard another "boom" and saw a blue electric arc. He reported that he felt the ground vibrate. The landscaper, the victim's father, also made contact with the electric current and went down. He remembers touching nothing at the time and reports that the electric current entered his body through his knees as he walked. The police arrived, initially under the mistaken impression that the loss of electric power in the area was due to terrorist activity. When they realized what had happened, they called for emergency medical assistance and notified the utility company.

The three injured workers were transported to three hospitals. The victim was transported to the nearest hospital where he was pronounced dead one hour and seven minutes after the initial 9-1-1 call. His father was transported

to another hospital where he was admitted and underwent surgery. The initially injured worker was transported to the regional hospital burn unit and remained an inpatient for approximately three months.

Tree trimmer No. 1 was hired by the paving contractor to finish the job. He remained at the site for the next three days.

RECOMMENDATIONS/DISCUSSION

Recommendation # 1: A knowledgeable person should assess each work site for safety hazards and design a work plan that addresses those hazards.

Discussion: This job site contained at least three important hazards: a tree that was taller than the distance to the overhead power line, interior rot of the tree (although it is not known if any exterior rot was visible), and wind. The tree could potentially contact the power line and the tree rot and wind could cause the tree to fall in an unexpected manner. The landscaper realized he did not have the skill to remove large trees and hired an experienced tree trimmer to assist him. When estimating the cost of the job, a qualified (experienced) person should inspect the work site to assess hazards and plan techniques to eliminate or reduce hazards and ensure safety. Based on the inspection, the employer or supervisor should design a work plan.

Recommendation # 2: The employer should conduct a job briefing, based on the work plan, before starting a job.

Discussion: The work plan should be devised prior to the work day so it is clear how the landscaping and/or tree removal will be done and necessary precautions taken. The landscaper and tree trimmer apparently talked about the job before starting work but did not realize the proximity to the overhead power lines. It is not known what directions were communicated to the work crew. The job briefing should be based on the work plan and should include a description of the work to be done, the environmental and safety hazards of the job, work assignments, and instructions on how to deal with those hazards.

Recommendation # 3: The employer should establish a written safety and health policy.

Discussion: Safety and health policies and company operational policies should be in writing. Although the landscaping company had a policy against alcohol and drug use, it was not in writing. Having policies in writing fosters consistency and makes rules and standards clear to all workers. A written safety and health policy should include organized training and education of workers.

Recommendation # 4: Safe tree removal techniques should be used.

Discussion: Several factors indicated that the oak tree should not have been felled. The tree was taller than the distance to the power lines and it was a windy day. Tree removal could have been accomplished by working from an aerial lift and taking the tree down in sections. It would not have been appropriate to climb the tree because of the internal rot of the tree (although the external appearance of the tree is unknown). Climbing a tree with interior rot would have been dangerous for a climber.

Workers should remain out of the area around a tree being felled. The landscaper, in his backhoe, could have been injured if the tree fell onto the machine. The backhoe would have offered little protection.

Regulations that pertain to the safe methods of tree removal include 29 CFR 1910:266, Logging Operations, and ANSI Z133.1-2000, American National Standard for Arboricultural Operations – Pruning, Repairing, Maintaining, and Removing Trees, and Cutting Brush – Safety Requirements. All employers and workers who

fell, trim, or work around tree removal should become familiar with the regulations appropriate for their jobs.

Recommendation # 5: Employers should notify the utility company when work is planned in an area near overhead power lines.

Discussion: When the utility company that owns the power lines reviewed the engineering plans for constructing the parking lot, it was stipulated that the utility company would be notified when work was to be started in the area of their right-of-way. It is not known who, according to the plans, had the responsibility to carry out the notification. If the power company had been notified, they would have been able to deenergize the power lines and therefore eliminate the potential of contact with the electric current.

When the tree came down on the power line, the utility company was notified by the police. No attempt should have been made to remove or dislodge a tree or equipment from contact until the line had been deenergized. In this event, serious injury or death could have resulted from indirect contact with the electric current. Electrical current could have flowed from the power line to the tree, to the chain saw, and to the worker.

Recommendation # 6: Employers and employees should become familiar with available resources on safety standards and safe work practices.

Discussion: It is extremely important that employers and workers obtain accurate information on safety, and applicable OSHA standards. The following sources of information may be helpful:

U.S. Department of Labor, OSHA
Federal OSHA will provide information on safety and health standards on request. OSHA has several offices in New Jersey that cover the following counties:

Hunterdon, Middlesex, Somerset, Union, and Warren counties
Telephone: (732) 750-3270

Essex, Hudson, Morris, and Sussex counties
Telephone: (973) 263-1003

Bergen and Passaic counties
Telephone: (201) 288-1700

Atlantic, Burlington, Cape May, Camden, Cumberland, Gloucester, Mercer, Monmouth, Ocean, and Salem counties
Telephone: (856) 757-5181

Federal OSHA
Website: www.osha.gov

NJ Public Employees Occupational Safety and Health (PEOSH) Program
The PEOSH act covers all NJ state, county, and municipal employees. Two state departments administer the act; the NJ Department of Labor (NJDOL) which investigates safety hazards, and the NJ Department of Health and Senior Services (NJDHSS) which investigates health hazards. PEOSH has information that may also benefit private employers. Their telephone numbers are:

NJDOL, Office of Public Employees Safety
Telephone: (609) 633-3896
Website: www.state.nj.us/labor/lsse/lspeosh.html

NJDHSS, Public Employees Occupational Safety & Health Program
Telephone: (609) 984-1863
Website: www.state.nj.us/health/eoh/peoshweb

NJDOL Occupational Safety and Health On-Site Consultation Program
Located in the NJ Department of Labor, this program provides free advice to private businesses on improving safety and health in the workplace and complying with OSHA standards. For information on how to get a safety consultation, call:

Telephone: (609) 292-3923.
Website: www.state.nj.us/labor/lsse/lsonsite.html

New Jersey State Safety Council
The NJ State Safety Council provides a variety of courses on work-related safety. There is a charge for the seminars.

Telephone: (908) 272-7712.
Website: www.njsafety.org

Professional Organizations

National Arborist Association (NAA)
P.O. Box 1094, Amherst, NH 03031-1094
Telephone: (800) 733-2622

Committee for the Advancement of Arboriculture
Monmouth County Shade Tree Commission
P.O. Box 1255, Freehold, NJ 07728-1255
Telephone: (732) 431-7903

International Society of Arboriculture
P.O. Box 3129, Champaign, IL 61826-3129
Telephone: (217) 355-3516

Society of Commercial Arboriculture
P.O. Box 3129, Champaign, Il 61826-3129
Telephone: (217) 355-3516

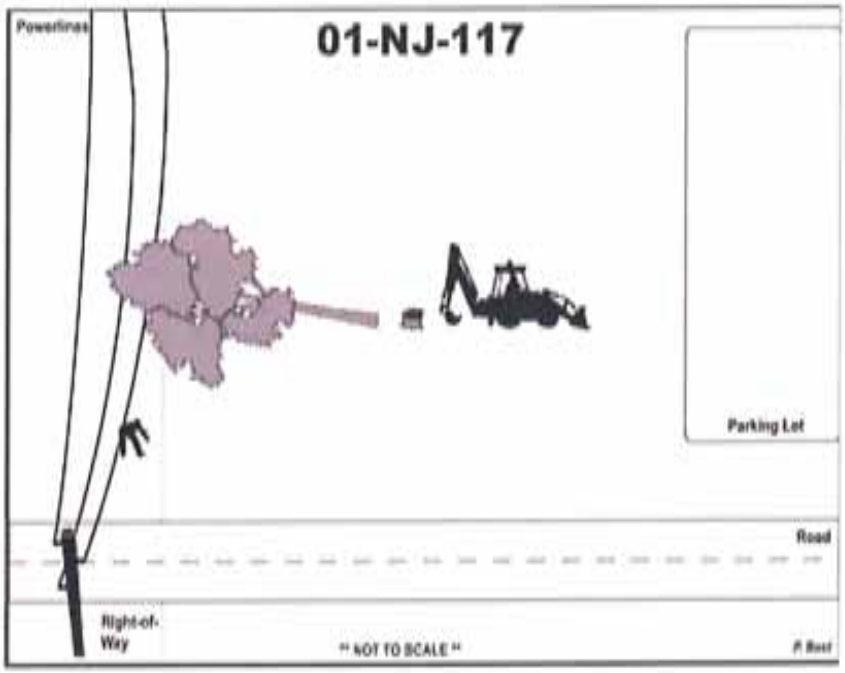
ACRT, Inc.
Utility Forestry Specialist
P.O. Box 401, 2545 Bailey Road, Cuyahoga Falls, OH 44221-0401
Telephone: (800) 622-2562

Shigo and Trees Association
4 Denbow Road, Durham, NH 03824
Telephone: (603) 868-7459

Internet Resources
Other useful internet sites for occupational safety and health information:

www.cdc.gov/niosh – The Centers for Disease Control and Prevention (CDC) / NIOSH website.
www.dol.gov/elaws – USDOL Employment Laws Assistance for Workers and Small Businesses.
www.nsc.org – National Safety Council.

ILLUSTRATIONS



REFERENCES

1. ANSI Z133.1-2000, 1994, for Arboricultural Operations - Pruning, Repairing, Maintaining, and Removing Trees, and Cutting Brush – Safety Requirements, American National Standards Institute, Inc., October 19, 2000.

2. Electrical Hazard Awareness Program Manual, National Arborist Association, 2002.

3. Job Hazard Analysis. US Department of Labor Publication # OSHA-3071, 1998 (revised). USDOL, OSHA/OICA Publications, PO Box 37535, Washington DC 20013-7535.

4. OSHA Logging Operations 29 CFR 1910.266.

5. Preventing Injuries and Deaths of Loggers, NIOSH Alert: May 1995, DHSS (NIOSH) Publication No. 95-101.

NJ Department of Health & Senior Services
Occupational Health Service
PO Box 360, Trenton NJ 08625-0360
(609) 984-1863

LANDSCAPING HAZARD ALERT

Do not operate lawn equipment on steep slopes. Always read and follow the manufacturer's manual.

Photo provided by ExMark.

Be aware of overhead power lines when trimming branches or cutting down trees.

Do not operate lawn equipment too close to water. Be aware of drop offs and muddy or unstable ground.

Photo provided by ExMark.

Always wear your eye and hearing protection.

OSHA Occupational Safety and Health Administration

Phone: 954-424-0242

Lyme Disease facts

U.S. Department of Labor
Occupational Safety and Health Adminsitration

OSHA has published a hazard information bulletin (HIB) to provide guidance to people who reside in high or moderate risk areas in the United States and who are exposed to ticks during the course of their work and thus at risk of contracting Lyme disease.* Examples of outdoor work which may be associated with increased risk of exposure to infected ticks include: construction work, landscaping, forestry, brush clearing, land surveying, farming, railroad work, oil field work, utility line work, and park/wildlife management.

The Centers for Disease Control and Prevention (CDC) has developed a national Lyme disease risk map[1] in which CDC identified areas of the U.S. as minimal or no risk, low risk, moderate risk, or high risk for predicted Lyme disease. Areas at high or moderate risk include many counties in the Northeast U.S., some areas around the Great Lakes, and an area in Northern California. It is important that state and local health department authorities be consulted to determine risk in any given area, since risk can vary even within a county, and perhaps from year to year.

Lyme disease is caused by *Borrelia burgdorferi*, a bacterium carried in the gut of certain ticks. When these infected ticks attach to the human body (often in armpits, groin, scalp, or other hairy, hidden body areas), they slowly feed, and within 36-48 hours they may transmit *B. burgdorferi* to their human host. Young ticks are especially abundant and are seeking hosts in late spring and early summer, although adult ticks can transmit infection as well.

* See OSHA HIB 00-04 online at www.osha.gov or by calling your nearest OSHA office listed in the blue pages of your telepone directory.

[1] "Recommendations for the Use of Lyme Disease Vaccine: Recommendations of the Advisory Committee on Immunization Practices (ACIP)." *MMWR* 6/4/1999, 48 (RR-7). **www.cdc.gov**.

National Lyme disease risk map with four categories of risk

Note: This map demonstrates an approximate distribution of predicted Lyme disease risk in the United States. The true relative risk in any given county compared with other counties might differ from that shown here and might change from year to year.[1]

Although a majority of people with Lyme disease develop a "bulls-eye" rash, 20-40% of persons who have the disease do not have a rash. Other signs and symptoms may be non-specific and similar to flu symptoms (e.g., fever, lymph node swelling, neck stiffness, generalized fatigue, headaches, migrating joint aches, or muscle aches). Diagnosis is based on a history of known exposure and development of clinical signs and symptoms, with blood testing providing valuable supportive information. Most cases of Lyme disease can be successfully treated with antibiotics. It is very important that Lyme disease be diagnosed and treated with antibiotics, since untreated Lyme disease may result in symptoms (i.e., arthritis, muscle pain, heart disease, brain and nerve disorders) that are severe, chronic, and disabling.

Prevention of Lyme Disease

First line of defense is decreasing the probability of tick bites.[1] Ticks can be vectors of other infections, in addition to Lyme disease.

- Avoidance of tick habitat (brushy, overgrown grassy, and woody areas) particularly in spring and early summer when young ticks feed.
- Removal of leaves, tall grass, and brush from areas around work areas or residential areas to decrease tick as well as host (deer and rodent) habitat.
- Application of tick-toxic chemicals to surrounding work or residential areas in accordance with federal, state, and local regulations and community standards.

Personal Protection

- Wearing light-colored clothing (to more easily see ticks).
- Wearing long-sleeved shirts, tucking pant legs into socks or boots (delays ticks from reaching skin so they can be more easily found before attaching).
- Wearing high boots or closed shoes covering entire foot.
- Wearing a hat.
- Using appropriate insect repellants on non-facial skin and permethrin on clothes (kills ticks) in accordance with Environmental Protection Agency guidelines.
- Showering and washing/drying clothes at high temperature after outdoor exposure.
- Doing a careful body check for ticks, prompt removal with tweezers and skin cleansing with antiseptic.

Workers at risk should be advised of the signs and symptoms of Lyme disease, as well as the primary and secondary preventive measures for this disease. Those who are at increased risk for Lyme disease should obtain medical advice regarding the applicability of the Lyme disease vaccine; those who have symptoms of suspected tick-borne infection should seek medical attention early. More detailed information regarding various aspects of Lyme disease prevention can be found on the CDC web site (www.cdc.gov).

The Directorate of Technical Support issues Hazard Information Bulletins (HIBs) in accordance with OSHA Instruction CPL 2.65 to provide relevant information regarding unrecognized or misunderstood health and safety hazards, as well as potential hazards associated with particular materials, devices, techniques, and engineering controls. An HIB is not a new standard or regulation, and it creates no legal obligations. It is advisory in nature, informational in content, and is intended for use by employers seeking to provide a safe and healthful workplace. The *Occupational Safety and Health Act* requires employers to comply with hazard-specific safety and health standards. In addition, employers must provide their employees with a workplace free from recognized hazards likely to cause death or serious physical harm under Section 5(a)(1), the General Duty Clause of the Act. Employers can be cited for violating the General Duty Clause if there is a recognized hazard and they do not take steps to prevent or abate the hazard. However, failure to implement HIB recommendations is not, in itself, a violation of the General Duty Clause. Citations can only be based on standards, regulations, and the General Duty Clause.

OSHA News Release

2002 - 09/27/2002 - Atlanta-area Company's Failure to Protect Tree Trimmer from Traffic Hazards Brings $42,000 in Proposed OSHA Penalties

OSHA News Release - Table of Contents

OSHA Regional News Release

U.S. Department of Labor
Office of Public Affairs **Region 4**

Region 4 News Release USDOL: 02-190
Fri., Sept. 27, 2002
Contact: Jo Anne Burgoyne
Phone: (404) 562-2076

Atlanta-area Company's Failure to Protect Tree Trimmer from Traffic Hazards Brings $42,000 in Proposed OSHA Penalties

ATLANTA -- Failing to provide proper traffic safety controls for a tree trimming crew, which resulted in the death of one worker, could cost Asplundh Tree Expert Co. $42,000 in proposed penalties, according to citations issued recently by the Department of Labor's Occupational Safety and Health Administration.

The fatal accident occurred March 28, as the Asplundh crew removed tree limbs from overhead power transmission lines along a winding, rural, two-lane road near Cumming, Ga. Because there was no room on the shoulder of the road, the company truck was parked in one lane of the road without any safety devices to warn approaching motorists.

As one of the two-person crew members worked near the front of the truck he was struck and killed by an oncoming vehicle.

"Our investigation found that this crew had not been provided with traffic safety equipment, such as signs or barricades, to place around the truck even though OSHA regulations and the company's safety procedures required their use," G.T. Breezley, OSHA Atlanta-East area director said.

The agency issued one serious citation with a proposed penalty of $7,000 for exposing employees to traffic hazards and one repeat citation with a proposed penalty of $35,000 for not providing employees with appropriate personal protective equipment such as high visibility reflective vests.

OSHA issues a repeat citation when an employer has been cited previously for a substantially similar condition and the citation has become a final order of the independent Occupational Safety and Health Review Commission The company has 15 working days to contest the OSHA citations and proposed penalties before the Commission.

The OSHA investigation was conducted by staff from the Atlanta-East area office located at LaVista Perimeter Office Park, Bldg. 7, Suite 110, Tucker, Ga.; phone: (770) 493-6644

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NIOSH Safety and Health Topic:

West Nile Virus

Recommendations to Protect Outdoor Workers from West Nile Virus Exposure

Occupational Risk

The most likely way persons become infected with WNV is through the bite of an infected mosquito. Workers at risk of WNV exposure include those working outdoors when mosquitoes are actively biting—farmers, foresters, landscapers, groundskeepers and gardeners, painters, roofers, pavers, construction workers, laborers, mechanics, and other outdoor workers.

Workers at risk should receive training that describes and reinforces the potential occupational hazards and risks of WNV exposure and infection. The importance of timely reporting of all injuries and illnesses of suspected occupational origin should be emphasized. A medical surveillance system should be in place which includes the reporting of symptoms consistent with WNV infection and employee absenteeism due to WNV infection.

Recommendations for employers

Employers can help protect outdoor workers by implementing the control measures listed below. These controls are recommended regardless of other controls that may be in place, such as local mosquito control programs. Information about exposure to insecticides can be found at the links below.

Remove discarded tires from the worksite.

- When possible, schedule work to avoid having workers outdoors when mosquitoes are most active and biting, most often from dusk to dawn.
- Make insect repellents available to workers.
- Recommend that outdoor workers wear long-sleeved shirts, long pants, and socks when possible.
    - If employee uniforms are provided include long-sleeved shirts and long pants among uniform options.
- Eliminate as many sources of standing water as possible to eliminate mosquito breeding areas. Mosquitoes may be produced in any puddle or water that stands for more than four days. Take the following steps to decrease mosquito populations:
    - Change the water twice a week in animal drinking troughs, birdbaths, and other water containers.
    - Add an aerator to ponds and water gardens to keep the water circulating or add fish that will eat the mosquito larvae or adults.

West Nile Virus

James Gathany, CDC

Topic Index:

On This Page...

- Remove discarded tires from the worksite.
- Turn over, cover, or remove equipment such as tarps, buckets, barrels, wheel barrows and containers that accumulate water.
- Discard tires, buckets, cans, and containers in the area.
- Place drain holes in containers that collect water and cannot be discarded.
- Clean out rain gutters to get rid of standing water.
- Remove debris—leaves, twigs, trash—from ditches.
- Fill in or drain ruts and other areas that accumulate water.

Recommendations for workers

Outdoor workers can decrease their risk of WNV infection by reducing their contact with mosquitoes through the use of the personal protective measures listed below. Information about exposure to insecticides can be found at the links below.

Avoid being bitten by mosquitoes to protect against WNV infection.

Workers should take the following steps when working at sites where mosquitoes may be actively biting:

- Wear long-sleeved shirts, long pants, and socks when possible.
- Spray exposed skin with an insect repellent.
  - READ AND FOLLOW LABEL DIRECTIONS FOR REPELLENT USE.
    - Do not apply pump or aerosol products directly to the face. These products should be sprayed onto the hands and then carefully rubbed over the face, avoiding the eyes and mouth.
  - DEET (N,N-diethyl-m-toluamide or N,N-diethyl-3-methylbenzamide) is the most effective insect repellent available.
    - The more DEET a repellent contains the longer time it will be effective.
    - DEET concentrations higher than 50% do not increase the length of protection.
  - Use repellents at the lowest effective concentration.
  - Do not apply repellents to cuts, wounds, or irritated skin.
  - When needed, reapply repellents according to label directions.
- Wash treated skin with soap and water after returning indoors.
- Spray clothing with products containing DEET or permethrin, as mosquitoes may bite through thin clothing.
  - Permethrin should only be used on clothing; do not appy it directly to skin.
  - Wash treated clothing before wearing it again.
  - Do not apply repellent to skin that is under clothing.

For more recommendations for outdoor workers, link to the New York State Department of Health fact sheet for outdoor workers:
External Link: http://www.health.state.ny.us/nysdoh/westnile/education/2742.htm

For more information about insect repellents, link to these Web sites:

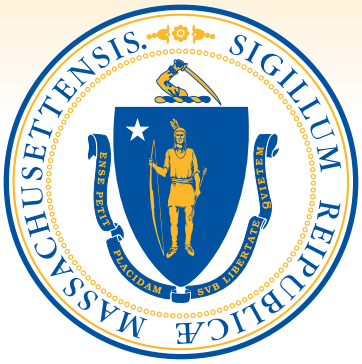
CDC: Insect Repellent Use and Safety
http://www.cdc.gov/ncidod/dvbid/westnile/qa/insect_repellent.htm

U.S. EPA: How to Use Insect Repellents Safely

External Link: http://www.epa.gov/pesticides/factsheets/insectrp.htm

The National Pesticide Information Center (NPIC) can be contacted by telephone at 1–800–858–PEST (1–800–858–7378), 9:30 a.m. to 7:30 p.m. eastern standard time, 7 days/week, or link to the NPIC Web site:
External Link: http://npic.orst.edu

Updated June 7, 2004



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On-Site Consultation Program
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